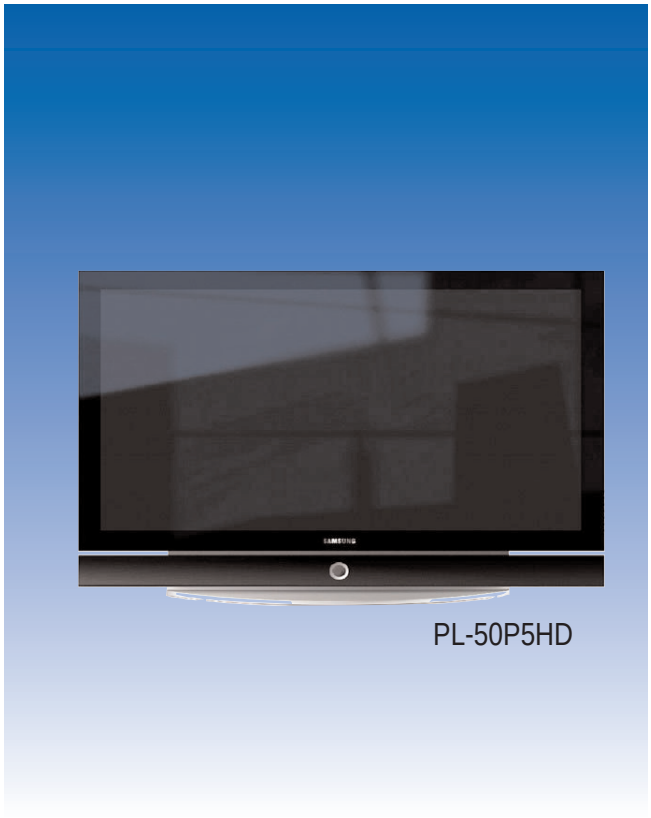
SAMSUNG

PLASMA DISPLAY TV

Chassis : D71C(N_HD_PODless_HDMI)_Strauss
Model : PL50P5HDX/XAX (PL-42P5HD)

SERVICE Manual

PLASMA DISPLAY TV



FEATURES

- NTSC/ATSC Tuner Built-In
- 12-Bit Processing (68.7 Billion Colors)
- Split Screen & Picture-In-Picture
- Samsung DNIe™ (Digital Natural Image engine)
- SRS TruSurround XT™
- 1 HDMI Input
- Energy Saving
- Anynet™ System Control Solution
- SAMSUNG EPG System

ELECTRONICS

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1. Precaution

To avoid possible damages or electric shocks or exposure to radiation, follow the instructions below with regard to safety, installation, service and ESD.

1-1 Safety Precautions

1. Make sure all protective devices are properly installed including non-metallic handles and compartment covers when installing or re-installing the chassis or chassis assemblies.

2. Make sure that no gaps exist between the cabinets for children to insert their fingers in to prevent children from receiving electric shocks. Gaps mentioned above include ventilation holes of a too great magnitude between the PDP module and the cabinet mask, and the improper installation of the rear cabinet.

   Errors may occur when the resistance is below 1.0 MΩ or over 5.2 MΩ.
   In these cases, make sure that the device is repaired before sending it back to the customer.

3. Check for Electricity Leakage (Figure 1-1)
   Warning: Do not use an insulated transformer for checking the leakage. Use only those current leakage testers or mirroring systems that comply with ANSIC 101.1 and the Underwriter Laboratory's specifications (UL1410, 59.7).

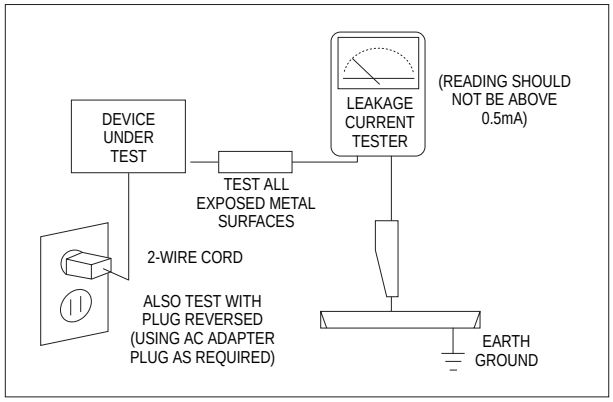

LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5mA)
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Fig. 1-1 AC Leakage Test

4. A high voltage is maintained within the specified limits using safety parts, calibration and tolerances. When voltage exceeds the specified limits, check each special part.

5. Warning for Engineering Changes:
   Never make any changes or additions to the circuit design or the internal part for this product.
   Ex: Do not add any audio or video accessory connectors. This might cause physical damage. Furthermore, any changes or additions to the original design/engineering will invalidate the warranty.

6. Warning - Hot Chassis:
   Some TV chassis are directly connected to one end of the AC power cord for electrical reasons.
   Without insulated transformers, the product can only be repaired safely when the chassis is connected to the earthed end of the AC power source.

   To make sure the AC power cord is properly connected, follow the instructions below. Use the voltmeter to measure the voltage between the chassis and the earthed ground. If the measurement is over 1.0V, unplug the AC power cord and change the polarity before re-inserting it. Measure the voltage between the chassis and the ground again.

7. Some TV chassis are shipped with an additional secondary grounding system. The secondary system is adjacent to the AC power line. These two grounding systems are separated in the circuit using an unbreakable/unchangeable insulation material.

8. When any parts, material or wiring appear overheated or damaged, replace them with new regular ones immediately. When any damage or overheating is detected, correct this immediately and make a regular check of possible errors.

9. Check for the original shape of the lead, especially that of the antenna wiring, any sharp edges, the AC power and the high voltage power. Carefully check if the wiring is too tight, incorrectly placed or loose. Never change the space between the part and the printed circuit board. Check the AC power cord for possible damages. Keep the part or the lead away from any heat-emitting materials.

10. Safety Indication:
    Some electrical circuits or device related materials require special attention to their safety features, which cannot be viewed by the naked eye. If an original part is replaced with another irregular one, the safety or protective features will be lost even if the new one has a higher voltage or more watts.

    Critical safety parts should be bracketed with (⚠ ⚠). Use only regular parts for replacements (in particular, flame resistance and dielectric strength specifications). Irregular parts or materials may cause electric shock or fire.

1-2 Servicing Precautions

Warning 1: First carefully read the "Safety Instruction" in this service manual.
When there is a conflict between the service and the safety instructions, follow the safety instruction at all times.

Warning 2: Any electrolytic capacitor with the wrong polarity will explode.

1. The service instructions are printed on the cabinet, and should be followed by any service personnel.

2. Make sure to unplug the AC power cord from the power source before starting any repairs.
   (a) Remove or re-install parts or assemblies.
   (b) Disconnect the electric plug or connector, if any.
   (c) Connect the test part in parallel with the electrolytic capacitor.

3. Some parts are placed at a higher position than the printed board. Insulated tubes or tapes are used for this purpose. The internal wiring is clamped using buckles to avoid contact with heat emitting parts. These parts are installed back to their original position.

4. After the repair, make sure to check if the screws, parts or cables are properly installed. Make sure no damage is caused to the repaired part and its surroundings.

5. Check for insulation between the blade of the AC plug and that of any conductive materials (i.e. the metal panel, input terminal, earphone jack, etc).

6. Insulation Check Process: Unplug the power cord from the AC source and turn the switch on. Connect the insulating resistance meter (500v) to the AC plug blade.

   The insulating resistance between the blade of the AC plug and that of the conductive material should be more than 1 MΩ.

7. Any B+ interlock should not be damaged.
   If the metal heat sink is not properly installed, no connection to the AC power should be made.

8. Make sure the grounding lead of the tester is connected to the chassis ground before connecting to the positive lead. The ground lead of the tester should be removed last.

9. Beware of risks of any current leakage coming into contact with the high-capacity capacitor.

10. The sharp edges of the metal material may cause physical damage, so ensure wearing protective gloves during the repair.

11. Due to the nature of plasma display panels, partial after-images may appear if a still picture is displayed on the screen for a long period of time.
    This is caused by brightness deterioration due to the storage effect of the panel, and to prevent this from happening, we recommend that the brightness and contrast are reduced.
    (e.g.) Contrast: 25, Brightness: 50

1-3 Static Electricity Precautions

1. Some semi-conductive ("solid state") devices are vulnerable to static electricity. These devices are known as ESD. ESD includes the integrated circuit and the field effect transistor. To avoid any materials damage from electrostatic shock, follow the instructions described below.

2. Remove any static electricity from your body by connecting the earth ground before handling any semi-conductive parts or ass'ys. Alternatively, wear a dischargeable wrist-belt.
   (Make sure to remove any static electricity before connecting the power source - this is a safety instruction for avoiding electric shock)

3. Remove the ESD ass'y and place it on a conductive surface such as aluminum foil to prevent accumulating static electricity.

4. Do not use any Freon-based chemicals.
   Such chemicals will generate static electricity that causes damage to the ESD.

5. Use only grounded-tip irons for soldering purposes.

6. Use only anti-static solder removal devices.
   Most solder removal devices do not support an anti-static feature. A solder removal device without an anti-static feature can store enough static electricity to cause damage to the ESD.

7. Do not remove the ESD from the protective box until the replacement is ready. Most ESD replacements are covered with lead, which will cause a short to the entire unit due to the conductive foam, aluminum foil or other conductive materials.

8. Remove the protective material from the ESD replacement lead immediately after connecting it to the chassis or circuit ass'y.

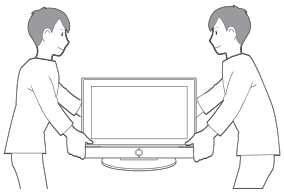
9. Take extreme caution in handling any uncovered ESD replacements. Actions such as brushing clothes or lifting your leg from the carpet floor can generate enough static electricity to damage the ESD.

CAUTION

These servicing instructions are for use by qualified service personnel only.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

1-4 Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.



2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.

3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.

4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.

5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.

6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the high-voltage cable or the antenna falling over may cause fire or electric shock.

7. When connecting the RF antenna, check for a DTV receiving system and install a separate DTV reception antenna for areas with no DTV signal.

8. When installing the product, leave enough space (4") between the product and the wall for ventilation purposes.
   A rise in temperature within the product may cause fire.

9. When moving a PDP with attached speakers, detach the speakers first before moving the main body.
   Moving the PDP main body without separating the speakers may cause the speakers to detach, possibly causing damage or injury.

MEMO

2. Product Specification

2-1 Product Features

Block	Specfication	Major IC	Remark
RF	Digital/Analog (DTV Built In)	VSB NIM Tuner S5H2010A01 (Eagle+)	
PDP Module	Samsung SDI V4 Module	50" HD	New Module
Power	Samsung electro mechanics SMPS	50" HD SMPS	New SMPS
Video	NTSC 3.58, ATSC HDMI DNIe Lite Component, PC	STP22 (Scaler) SDP43 (DNIe Lite) MST9883 (PC A/D) Sil9993 (HDMI)	
Sound	Speaker : 15W + 15W SRS TruSurrond XT, Dolby Digital	MSP4440K, NSP-6241 TAS5122	Optical, Coaxial Output
Cabinet	P5 Design		New Cabinet

■ Chip Description

- DNVS303EH261A Tuner : ATSC/NTSC VSB NIM Tuner
- STP22 : Component, CVBS, Y/C, HDMI, PC input Video signal processor
- SDP43 : The DNIe IC for visual quality improvement. (DNIe Lite)
- Sii9993 : Converts the TMDS signal on the HDMI input into 8 bit digital R, G, B signals.
- MSP4440K : Sound Processing IC
- MST9883 : A/D converts the R, G, B input signal from 15 Pin PC video to 8 bit digital R, G, B signals.
- NSP6241A: Sound PWM IC
- TAS5122 : Sound AMP IC
- S5H2010A01 : MPEG Decoder IC (EAGLE+)
- S3C2800X01 : CPU IC
- 3F8668 : Generates various control signals required for operating the circuit.
  The software is downloaded through PC D-SUB Jack. (Sub Micom)

2-2 Key Features

Model		PL-50P5HD
Dimensions	Display	1230.1 (W) x 826.0 (H) x 94.5 (D) mm (Without Stand)
		1230.1 (W) x 875.5 (H) x 334.8 (D) mm (With Stand)
Weight	Display	46.8Kg (Without Stand)
		53.5Kg (With Stand)
Voltage		AC 110 V~, 60 Hz
Number of Pixels		1366 (H) x 768 (V)
Screen Size		50 inches
ANTENNA input		ANT 1 - CABLE IN ANT 2 - AIR IN ※ 75Ω unbalanced
VIDEO input		AV 1, AV2 S-VIDEO 1, S-VIDEO 2 COMPONENT1 - 480i/480p/720p/1080i COMPONENT2 - 480i/480p/720p/1080i PC HDMI (DVI Compatible)
AUDIO input		AV 1, AV2 S-VIDEO 1, S-VIDEO 2 COMPONENT1 - 480i/480p/720p/1080i COMPONENT2 - 480i/480p/720p/1080i PC DVI
AV Output		AUDIO (L/R)
Speaker Output		15W + 15W (8Ω)
Audio Output		OPTICAL(DIGITALOUT) COAXIAL(DIGITALOUT)
ETC		DNIe Lite, Anynet, Color Weakness, My Color Control, SRS TruSurround XT, Dolby Digital, Built-in Speaker/Stand
New Function		Energy Saving, Screen Burn Protection

■ H/W Configuration
- DTV Module : S5H2010A01 (MPEG Decoder IC, Eagle+)
- Video : STP-22, MST9883, SiI9993, DNIe Lite
- Sound : MSP4440K, NSP-6241, TAS5122
- Tuner : UMX-NT-043 (RF-Splitter), DNVS303EH261A (VSB NIM Tuner)
- CPU : S3C2800X01, S3F866B, P_PCFM_012

■ S/W Configuration
- Main Program : TE28F640 (Flash memory)
- Sub-Micom : S3F866B
- DDC : 24C02 x2 (Analog DDC Data, Digital DDC Data)
- EEPROM : 24C256 (White balance data and Factory initial data)

■ Picture
- System : Video → ATSC / NTSC
- Progressive
- Output resolution : 1366 x 768 p
- OSD : Smart user Interface Grade 1
- Picture Enhancement : DNIe Lite
- Still picture, Noise reduction
- Comb Filter : 3D comb filter
- PIP : Large, Double 1, Double 2
- Picture Size : 16:9, Panorama, Zoom1, Zoom2, 4:3 (AV, S-Video, Component 480i/480p)
  16:9, 4:3 (Component 720p/1080i, PC, HDMI)

■ Sound
- System : Stereo
- Dolby Digital, TruSurround XT
- Output : 15W + 15W
- Speaker : Built-in
- Optical/Coaxial Sound Output : Dolby Digital, PCM (DTV), PCM (HDMI)

■ Feature
- Component Interface(480i/480p/720p/1080i, Y/Pb/Pr)
- Digital Interface : HDMI (480p/720p/1080i)
- Auto Program
- Sleep Timer : 180 Minutes
- Anynet Interface
- My Color Control
- Color Weakness
- Energy Saving
- Screen Burn Protection

■ In/Out Terminals
- 1 Monitor audio Output
- 2 Component Inputs
- 15 Pin PC D-sub Input
- 1 HDMI Input
- 2 SPDIF Outputs (Optical, Coaxial)
- 2 RF Input : Cable/Air
- 2 CVBS Input
- 2 S-Video Input

■ Remocon
- TM76

■ Power Supply
- 110 V~, 60Hz

■ HDMI input mode : 480p, 720p, 1080i

■ Note
- You can input the DVI ↔ HDMI conversion cable.
- When connecting HDMI input using the DVI ↔ HDMI conversion cable, connect the sound signal to the DVI Audio IN port using a separate connection cable.

■ PC(D-Sub 15Pin Jack) Input mode

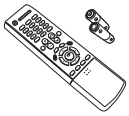
The table below shows all of the display modes that are supported. (N : Negative, P : Positive)

Video Signal	Resolution (Dot X Line)	Vertical Frequency (Hz)	Horizontal Frequency (KHz)	Vertical Polarity	Horizontal Polarity
IBM PC / AT Compatible	640 X 350	70.086	31.469	P	N
	720 X 400	70.087	31.469	N	P
	640 X 480	59.940	31.469	N	N
		70.000	35.000	N/P	N/P
		72.809	37.861	N	N
		75.000	37.500	N	N
	800 X 600	56.250	35.156	N/P	N/P
		60.317	37.879	P	P
		70.000	43.75	N/P	N/P
		72.188	48.077	P	P
		75.000	46.875	P	P
	1024 X 768	60.004	48.363	N	N
		70.069	56.476	N	N
		72.000	57.672	N/P	N/P
		75.029	60.023	P	P
	1280 X 720	59.855	44.772	P	N
	1360 X 768	60.015	47.712	P	P

2-3 Specifications Analysis

Model		PL-50D4H	PL-50P5HD
Design			
Basic	Display Type	PDP TV	PDP TV
	Built-In Tuner	×	○
	Resolution	1366 × 768	1366 × 768
	PDP Module	Samsung SDI V3	Samsung SDI V4
	Screen Size	50"	50"
	Picture ratio	16 : 9	16 : 9
	Dimensions	1205(W) x 724 (H) x 79 (D) mm	1230 (W) x 826 (H) x 95 (D) mm
	Weight	43 Kg (Without Stand)	46.8 Kg (Without Stand)
Picture	Brightness	1,000 Cd/m2	1,300 Cd/m2
	Contrast Ratio	3,000 : 1	10,000 : 1
	Picture Enhacer	DNIe 2	DNIe Lite
	Comb Filter	○	○
Audio	Equalizer	5 Band	5 Band
	Auto Volume Control	○	○
	Surround Sound	SRS TruSurround XT	SRS TruSurround XT Dolby Digital
	Speaker Output	15W + 15W	15W + 15W
Features	PIP	○	○
	Double Window	○	○
	Caption	○	○
	Still Image	○	○
	EPG	×	○
	My Color Control	○	○
	Color Weakness	○	○
	Energy Saving	×	○
	Anynet	×	○
Connections	Antenna	1	2 (Cable/Air)
	AV Input	2	2
	S-Video	1	2
	Component	2	2
	PC(D-SUB)	1	1
	DVI	1	×
	HDMI	×	1
	POD Cable Card	×	×
	Sub Woofer	×	×
	Optical	×	1
	Coaxial	×	1
ETC	Speaker/Stand	Built-in Speaker/Stand	Built-in Speaker/Stand
	FCC Class	Class B	Class B

2-4 Accessories

Accessories		Item	Item code	Remark
Supplied Accessories		Owner's Instructions	BN68-00825Q	Samsung Service center
		Remote Control AAA Batteries	BN59-00462A 4301-000103	
		Power Cord	3903-000144	
		Anynet Cable	BN39-00518A	
Accessories that can be purchased additionally		S-VIDEO Cable	-	Internal shopping mall
		HDMI Cable	-	
		HDMI/DVI cable	-	
		Component Cables (RCA)	-	
		PC Cable	-	
		PC Audio Cable	-	
		Optical Cable	-	
		Coaxial Cable	-	
		Antenna Cable	-	

3. Alignment & Adjustment

3-1 Service Instruction

* Check items listed after changing each

Replaced Items	Item Code	Check Items
ASSY PCB MISC-MAIN	BN94-00860A	1) Auto Program 2) Let the user go through subscription process after contacting user's cable service provider.
ASSY PCB P-SMPS(MAIN)	BN96-01801B	Voltage Adjustment
ASSY PCB P-SMPS(DC DC)	BN96-01856A	Voltage Adjustment
ASSY PDP P-LOGIC BOARD	BN96-03097A	-
ASSY PDP P-X MAIN BOARD	BN96-03090A	-
ASSY PDP P-Y MAIN BOARD	BN96-03091A	-
ASSY PDP P-Y UPPER BUFFER BOARD	BN96-03092A	-
ASSY PDP P-Y LOWER BUFFER BOARD	BN96-03093A	-
ASSY PDP P-ADDRESS E BUFF BOARD	BN96-03094A	-
ASSY PDP P-ADDRESS F BUFF BOARD	BN96-03095A	-
ASSY PDP P-ADDRESS G BUFF BOARD	BN96-03096A	-

※ When replacing the SMPS or PDP panel, you have to check the voltage printed on the panel sticker and adjust it.

3-2 How to Access Service Mode

■ Using the Customer Remote

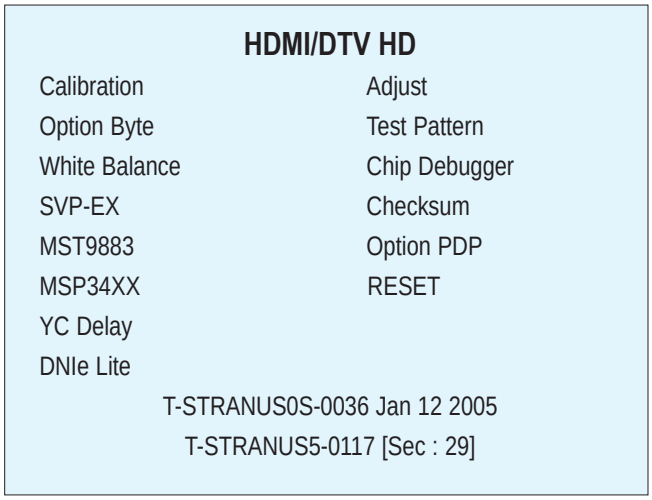
1. Turn the power off and set to stand-by mode.

2. Press the remote buttons in this order; MUTE-1-8-2- POWER ON to turn the set on.

3. The set turns on and enters service mode.

4. Press the Power button to exit and store data in memory.
   ※ If you fail to enter service mode, repeat steps 1 and 2 above.

5. Initial SERVICE MODE DISPLAY State



※ "T-STRANUS0S-0036" and "T-STRANUS5-0117" are firmware version.
The firmware version is subject to change without notice.

6. Buttons operations within Service Mode

MENU	Full Menu Display / Move to Parent Menu
Direction keys ▲ / ▼	Item Selection by Moving the Cursor
Direction keys ◀ / ▶	Data Increase/Decrease for the Selected Item
Source	Cycles through the active input source that are connected to the unit

3-3 Factory Data

★ The underlined are items applied during the service adjustment. None of the others should be adjusted.

1. Calibration

ITEM	
AV Calibration	Off
Comp Calibration	Off
PC Calibration	Off

2. Option Byte

ITEM	
Caption Level	16
V-Chip Enable	1
Watchdog Enable	1
Spread Enable PC	1
Clock Adjust	4
MST3385 USED	0
STA323 USED	0
Nim Version	T310
MSP Version	K
New_WB_CbCr	1

3. White Balance

ITEM	Range	Initial Values of Input Modes			
		TV/AV/S-video	Component	PC	HDMI
Sub Bright(SVP)	0~1204	495	513	480	492
R-Offset	0~1204	516	512	512	515
G-Offset	0~1204	512	512	512	512
B-offset	0~1204	512	512	512	511
Sub Contrast(DNIe)	0~255	130	131	128	131
R-Gain	0~255	132	132	128	132
G-Gain	0~255	125	125	128	125
B-Gain	0~255	140	140	128	140
Sub Contrast(SVP)		256	256	256	256
Comb Filter		0	0	0	0
Peaking		0	0	0	0
NR		0	0	0	0
Deinterlace		0	0	0	0

4. SVP-EX

ITEM	Range	Initial Values of Input Modes					
		TV	AV/S-Video	Component		PC	HDMI
				480i/P	720/1080		
00.Comb Filter							
01.Y-Filter							
01.Peaking							
01.V-PosGain	0~15	4	3	2	2	0	3
02.V-NegGain	0~15	4	4	4	2	0	4
03.V-BpGain	0~32	16	16	16	16	16	16
04.V-HfGain	0~32	20	20	20	20	20	20
05.V-Peaking-TH 1	0~256	16	16	16	16	16	16
06.V-Peaking-TH 3	0~256	128	128	128	128	128	128
02.NR							
01.Y-NR-Off							
02.C-NR-Off							
03.Y-NR-On							
04.C-NR-On							
03.Deinterlace							
01.Motion							
04.Picture Gain Adjust							
01.TCD3 Contrast	0~255	120	120	120		120	120
02.TCD3 Brightness	0~255	49	49	49		49	49
03.TCD3 YC Delay	0~15	1	1	1		1	1
04.Analog Y Offset	0~1023	61	61	61		61	61
05.Analog PB Offset	0~1023	512	512	512		512	512
06.Analog PR Offset	0~1023	512	512	512		512	512
07.Analog Y Gain	0~255	217	217	217		217	217
08.Analog PB Gain	0~255	225	225	225		225	225
09.Analog PR Gain	0~255	225	225	225		225	225
10.Black Level Setting	0~255	16	16	16		0	16
11.Brightness	0~255	128	128	125		128	128
12.UserColor(MAX)	0~127	127	127	127		127	127
06.WB Control							
01.MP R-Offset2	0~1023	512	512	512		512	512
02.MP G-Offset2	0~1023	512	512	512		512	512
03.MP B-Offset2	0~1023	512	512	512		512	512
04.PP R-Offset2	0~1023	512	512	512		512	512
05.PP G-Offset2	0~1023	512	512	512		512	512
06.PP B-Offset2	0~1023	512	512	512		512	512

ITEM	Sub Address 'h	Range	Initial Values of Input Modes									
			TV	AV/ S-Video	Component				HDMI			PC
					480i	480p	720p	1080i	480P	720P	1080i	
07. Chroma												
01.LtiPeakGain	P1 Luma/Croma 0x0F [4:0]	0~31	31	31	31	31	31	31	31	31	31	15
02.LtiStep	P1 Luma/Croma 0x0F [6:5]	0~3	2	2	2	2	2	2	2	2	2	2
03.LtiTh	P1 Luma/Croma 0x10 [7:0]	0~255	16	16	16	16	16	16	16	16	16	16
04.LtiGain	P1 Luma/Croma 0x11 [4:0]	0~31	8	10	10	10	10	10	10	10	10	8
05.LowPassGain	P1 Luma/Croma 0x12 [4:0]	0~31	8	24	17	15	15	20	10	10	10	2
06.BandPassGain	P1 Luma/Croma 0x13 [4:0]	0~31	18	25	24	20	25	28	25	25	25	12
07.HighPassGain	P1 Luma/Croma 0x14 [4:0]	0~31	20	28	18	18	24	24	24	24	24	4
08.PeakStep	P1 Luma/Croma 0x12 [6:5]	0~3	1	1	1	0	0	0	1	0	0	1
09.PeakTh1	P1 Luma/Croma 0x15 [7:0]	0~255	7	7	7	7	7	10	7	7	7	7
10.PeakTh2	P1 Luma/Croma 0x16 [7:0]	0~255	2	2	2	2	0	3	2	2	2	0
11.PeakTh3	P1 Luma/Croma 0x19 [7:0]	0~255	32	32	32	32	32	34	32	32	32	32
12.PeakN1Factor2	P1 Luma/Croma 0x14 [7:5] P1 Luma/Croma 0x13 [7:5]	0~63	56	8	8	8	0	8	0	0	0	0
13.PeakN1Factor1	P1 Luma/Croma 0x1A [5:0]	0~63	40	48	48	40	48	40	40	40	40	48
14.CoringTh	P1 Luma/Croma 0x17 [7:0]	0~255	2	2	2	2	2	2	2	2	2	0
15.CoringGain	P1 Luma/Croma 0x18 [4:0]	0~31	8	0	8	8	8	12	8	8	8	24
16.PeakPosGain	P1 Luma/Croma 0x49 [7:4]	0~15	1	1	2	2	2	2	1	2	2	3
17.PeakNegGain	P1 Luma/Croma 0x49 [3:0]	0~15	1	1	2	2	1	1	1	2	2	3
18.BypassHsharp	P1 Luma/Croma 0x1A [6]	0~1	0	0	0	0	0	0	0	0	0	1
19.DctiGain	P1 Luma/Croma 0x28 [3:0]	0~15	4	4	10	10	10	10	4	4	4	12
20.DctiStep	P1 Luma/Croma 0x29 [6:4]	0~7	1	1	7	1	1	1	1	1	1	3
21.DctiEnable	P1 Luma/Croma 0x29 [7]	0~1	1	1	1	1	1	1	1	1	1	0
22.DctiThres	P1 Luma/Croma 0x2A [7:0]	0~255	12	12	12	12	12	12	12	12	12	12
08.CLK_A	P5. DSS 0x0A[15:0]	16~17	16		16				16			16
09.CLK_B	P5. DSS 0x0B[15:0]	0~255	32		32				48			32
10.GAMMA			1		1				1			0

5. MST9883

ITEM	Range	Initial Values of Input Modes			
		TV/AV/SVHS	Component	PC	HDMI
R_Gain	0~255	112	112	112	112
G_Gain	0~255	112	112	112	112
B_Gain	0~255	113	113	113	113
R_Offset	0~255	122	122	122	122
G_Offset	0~255	121	121	121	121
B_Offset	0~255	122	122	122	122

6. MSP34XX

ITEM	Range	Initial
FM-Prescale	0~255	0x20
NICAM-Prescale	0~255	0x20
AV-Prescale	0~255	0x1C
I2S_1 Prescale	0~255	0x10
I2S_3 Prescale	0~255	0x11
Carrier Mute	0~255	On
Pilot High	0~255	0x0D
Pilot Low	0~255	0x07
Scart1 Out Volume	0~255	0x6D
Scart2 Out Volume	0~255	0x73

7. YC Delay

ITEM	Range	Initial Values of Input Modes			
		TV/AV/SVHS	Component	PC	HDMI
RF PAL-B/G	0~255	0	-	-	-
RF PAL-D/K	0~255	0			
RF PAL- I	0~255	0			
RF SECAM-B/G	0~255	0			
RF SECAM-D/K	0~255	0			
RF SECAM-L/L'	0~255	0			
RF NTSC3.58	0~255	0			
RF NTSC4.43	0~255	0			
AV PAL	0~255	0			
AV SECAM	0~255	0			
AV NTSC 3.58	0~255	0			
AV NTSC4.43	0~255	0			
AV PAL60	0~255	0			

8. DNIe Lite

ITEM	Range	Initial Values of Input Modes			
		TV/AV/SVHS	Component	PC	HDMI
01.PATT_SEL	0~63	0	0	0	0
02.BLACK_TILT	0~255	110	125	80	110
03.BLACK_GAINMAX	0~1023	380	390	370	380
04.TEST_MCC	0~255	0	0	0	0
05.OVERLAP_MCM	0~255	0	0	0	0
06.AREA_EN_MCC	0~255	31	31	31	31
07.I2C Offset Mean	0~63	16	10	10	10
08.I2C Ana Check		0	0	0	0
09.White Balance(Post)					
1.R-Offset(Post)	-512~511	0	0	0	0
2.G-Offset(Post)	-512~511	0	0	0	0
3.B-Offset(Post)	-512~511	0	0	0	0
4.R-Gain(Post)	0~255	0	128	128	128
5.G-Gain(Post)	0~255	0	128	128	128
6.B-Gain(Post)	0~255	0	128	128	128
7.Com_Offset_Sel	0,1	1	0	0	0
8.Com_Gain_Sel	0,1	1	0	0	0
10.ColorTone Cool2	Refer to Table 3				
11.ColorTone Cool1					
12.ColorTone Normal					
13.ColorTone Warm1					
14.ColorTone Warm2					
15.MCM_EN	0,1	1	1	1	1
16.TEMP_DEST	0~255	150	150	150	150
17.CB5_HIGH	0~255	139	140	156	141
18.CR5_HIGH	0~255	125	126	126	124
19.CB5_LOW	0~255	128	127	126	128
20.CR5_LOW	0~255	129	130	129	129

9. Adjust

ITEM	Range	Initial Values of Input Modes			
		TV/AV/SVHS	Component	PC	HDMI
01.Video Mute Time	0~63	5	-	-	5
02.Melody Volume	0~63	10	-	-	20
03.Dynamic Contrast		0	0	0	0
04.Dynamic Bright		0	0	0	0
05.Dynamic Color		0	0	0	0
06.Dynamic Sharpness		0	0	0	0
07.Standard Contrast		0	0	0	0
08.Standard Bright		0	0	0	0
09.Standard Color		0	0	0	0
10.Standard Sharpness		0	0	0	0
11.Movie Contrast					
12.Movie Bright					
13.Movie Color					
14.Movie Sharpness					
15.RF_dB_1		Rf	AV		
-.Noise Thres1	0~255	20	20		
-.LowPassGain1	0~31	7	14		
-.BandPassGain1	0~31	12	19		
-.HighPassGain1	0~31	6	16		
-.PeakStep1		1	1		
-.CoringTh1		2	2		
-.CoringGain1		8	2		
-.PosGain1		1	1		
-.NegGain1		1	1		
-.V-PosGain1		3	3		
-.V-NegGain1		2	2		
16.RF_dB_2					
-.Noise Thres2		30	40		
-.LowPassGain2		5	10		
-.BandPassGain2		8	15		
-.HighPassGain2		0	8		
-.PeakStep2		0	0		
-.CoringTh2		12	8		
-.CoringGain2		8	10		
-.PosGain2		1	1		
-.NegGain2		1	1		
-.V-PosGain2		2	2		
-.V-NegGain2		1	1		

ITEM	Range	Initial Values of Input Modes			
		TV/AV/SVHS	Component	PC	HDMI
17.RF_dB_3					
-.Noise Thres3		40	60		
-.LowPassGain3		0	5		
-.BandPassGain3		0	12		
-.HighPassGain3		0	4		
-.PeakStep3		0	0		
-.CoringTh3		26	14		
-.CoringGain3		15	16		
-.PosGain3		0	0		
-.NegGain3		0	0		
-.V-PosGain3		0	0		
-.V-NegGain3		0	0		

10. Test Pattern

01. OSD Pattern
  01. Luma Ramp(32 Step)
  02. Luma Ramp(128 Step)
  03. White 16
  04. White 240
  05. Color Bar
  06. RGB Ramp(32 Step)
  07. Cross Hatch(20X20)
02. 1 Channel Pattern
  01. Y-Filter
  02. V-PosGain
  03. V-NegGain
  04. V-BpGain
  05. V-HfGain
  06. V-Peaking-Th1
  07. V-Peaking-Th3
03. 2 Channel Pattern
  01. Luma Ramp(32 Step)
  02. Luma Ramp(128 Step)
  03. White 16
  04. White 240
  05. Color Bar
  06. RGB Ramp(32 Step)
  07. Cross Hatch(20X20)

11. Chip Debugger : ON/OFF (Select this menu before downloading sub-micom image)

12. Checksum [XXXX]

13. Option PDP : ON/OFF

ITEM	Range	Initial
01.Pixel Shift		0
-.Pixel Shift Test	0~1	0
-.Number Range	0~1	1
-.Line Range	0~1	1
02.Sound SD delay	0~2	1
03.Sound HD delay	0~2	1
04.Sound DTV delay	0~1	0
05.DDC Write	0~1	0
06.Auto Voltage Adj		5
-.Auto Voltage On		Off
-.AVC Set Mode		0
-.Manual Control_Vs		180
-.Manual Control_Va		55
-.Vs Reference		0
-.Vs Average		0
-.Va Reference		0
-.Va Average		0
07.Image Sticking		0
08.Error Mode Check		1
09.Error Code Table		4
10.Patt Sel		0
11.Control Key Lock		0
12.FCRL Con		1

14. KS1406

ITEM	Range	Initial
01.AGC_REF[AIR]		0x50
02.CR_F_GAIN[AIR]	0~2	0xD0B
03.CR_L_GAIN[AIR]	0~2	0x24
04.EQ_STEP[AIR]	0~1	0x0B
05.AGC_REF[CABLE]	0~1	0x60
06.CR_F_GAIN[CABLE]		0xC0B
07.CR_L_GAIN[CABLE]		0x50
08.EQ_STEP[CABLE]		0x03

15. Reset : Factory reset (User settings in OSD is initialized.)

3-4 Service Adjustment

3-4-1 White Balance Adjustment

1. W/B Adjustment is required for the following sequence.
   Color Calibration (CVBS,Component,PC) → W/B Adjustment (HDMI,Component,CVBS)

2. Adjustment Method (Signal equipment : MSPG-925LTH, Measurement equipment : CA210)

3. You can adjust the white ratio in factory mode (Calibration, White Balance menu).

4. Since the adjustment value and the data value vary depending on the input source, you have to adjust these in HDMI, Component and AV modes.

5. The optimal values for each mode are configured by default. (Refer to Table 2 and 3)

Equipment: CA-210 & Master MSPG925 Generator
Calibration Pattern: Master MSPG925 #24 "Lattice pattern"
W/B adjustment Pattern: Master MSPG925 #16 "ABL pattern"

Use other equipment only after comparing the result with that of the Master equipment.
Set Aging Time: Longer than 30 min.
Pattern Resolution: Given below.
Calibration Available/None and Pattern used for Calibration.

Input mode	Calibration	Pattern
CVBS IN (Model_#1)	Perform in NTSC B&W Pattern #24	Lattice
Component IN (Model_#6)	Perform in 720p B&W Pattern #24	Lattice
PC Analog IN (Model_#21)	Perform in VESA XGA (1024x768) B&W Pattern #24	Lattice
HDMI IN	None	-

<Table 1>

White Balance coordinates configuration result. (On the basis of the ABL pattern. The resolutions are given below)

Input mode		x	y	Y(fL)	T(K)/MPCD
CVBS IN (NTSC)	H/L	265	265	Do not adjust	15000K/-5
	L/L	280	285	0.8	10000K/-5
Component IN (720p, 60Hz)	H/L	265	265	Do not adjust	15000K/-5
	L/L	280	285	0.8	10000K/-5
PC Analog IN	None				
HDMI IN (720p, 60Hz)	H/L	265	265	Do not adjust	15000K/-5
	L/L	280	285	0.8	10000K/-5

<Table 2>

For PC Mode, perform only calibration and do not perform additional W/B adjustments.

Item		Warm 2	Warm 1	Normal	Cool1	Cool2
AV Component HDMI	R Cutoff	128	128	128	128	128
	G Cutoff	128	128	128	128	128
	B Cutoff	128	128	128	128	128
	R Gain	128	128	128	128	128
	G Gain	128	128	128	128	128
	B Gain	128	128	128	128	128
PC	R Cutoff	128	128	128	128	128
	G Cutoff	128	128	128	128	128
	B Cutoff	128	128	128	128	128
	R Gain	128	128	128	128	128
	G Gain	128	128	128	128	128
	B Gain	128	128	128	128	128

<Table 3>

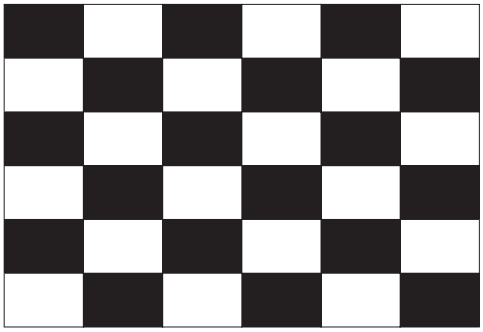
3-4-2 Conditions for Measurement

1. On the basis of toshiba ABL pattern : High Light level (57 IRE)
   ■ INPUT SIGNAL GENERATOR : MSPG-925LTH
   * Mode NO 1 : 744X484@60 Hz
   NO 6 : 1280X720@60 Hz
   NO 21 : 1024X768@60 Hz
   * Pattern NO 24 : B&W Lattice Pattern
   NO 16 : Toshiba ABL Pattern

2. Optical measuring device : CA210 (FL)
   Please use the MSPG-925 LTH generator for model PL-50P5HD

3-4-3 Method of Adjustment

1. Adjust the basic level of Component,PC and CVBS input signals.
   a) Enter factory Calibration, confirm the ADC data (Component, PC, AV Modes).
   * ADC default value : Table 1



Picture 2-1 B&W Lattice Pattern

* You must perform Calibration in the Lattice pattern before adjusting the White Balance.
* If you perform Calibration in a pattern other than the Lattice pattern, it causes a malfunction and the operation will not finish. In this case, press the "EXIT" button on the remote control to terminate the operation.

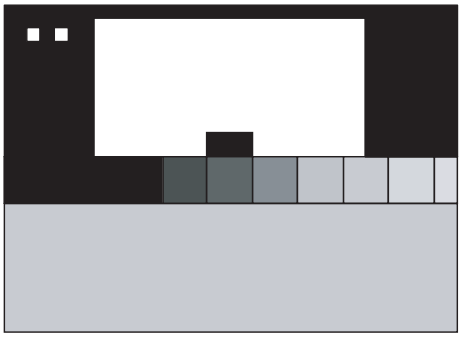
1) Enter Service mode.
2) Apply the NTSC Lattice (No 1) pattern signal to the VIDEO IN port.
3) Press the Source key to switch to "AV/S-VIDEO" mode.
4) After confirming that the Lattice pattern appears, select the "Calibration" menu.
5) Select the "AV Calibration" menu.
6) In "AV Calibration Off" status, press the "▶" key to perform Calibration.
7) When Calibration is complete, it returns to the high-level menu.
8) Apply the 720p Lattice (No 6) pattern signal to the COMPONENT IN (Y/Pb/Pr) port.
9) Press the Source key to switch to "COMPONENT" mode.
10) After confirming that the Lattice pattern appears, select the "Calibration" menu.
11) Select the "COMP Calibration" menu.
12) In "COMP Calibration Off" status, press the "▶" key to perform Calibration.
13) When Calibration is complete, it returns to the high-level menu.
14) Apply the 1024x768 Lattice (No 21) pattern signal to the PC IN port.
15) Press the Source key to switch to "PC" mode.
16) After confirming that the Lattice pattern appears, select the "Calibration" menu.
17) Select the "PC Calibration" menu.
18) In "PC Calibration Off" status, press the "▶" key to perform Calibration.
19) When Calibration is complete, it returns to the high-level menu.
20) All Calibration operations are complete.

2. Adjust the white balance of HDMI,Component and AV Modes.

a) Set the input to the mode in which the adjustment will be made (HDMI, Component, AV adjustment. Do not adjust in PC Mode.)

* Input signal - AV Mode : Model #1 (744*484 Mode), Pattern #16
- Component/HDMI Mode : Model #6 (1280*720 Mode), Pattern #16

b) Enter the White Balance menu of service mode and confirm the data.

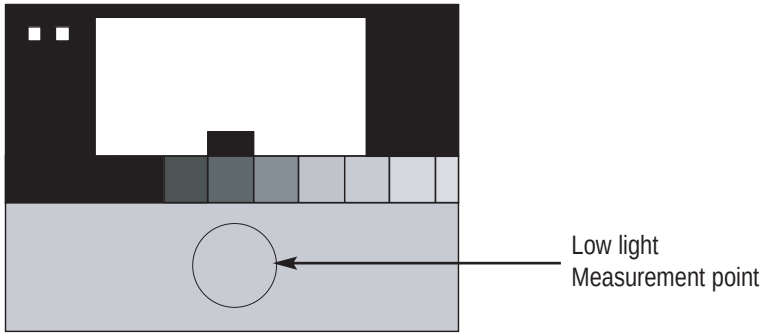


Picture 2-2 Toshiba ABL Pattern

c) Adjust the low light. (Refer to Picture 2-3 for measurement point.)

- Adjust Sub-Bright(SVP) to set the 'Y' value.
- Adjust red offset ('x') and blue offset ('y') to the color coordinates.

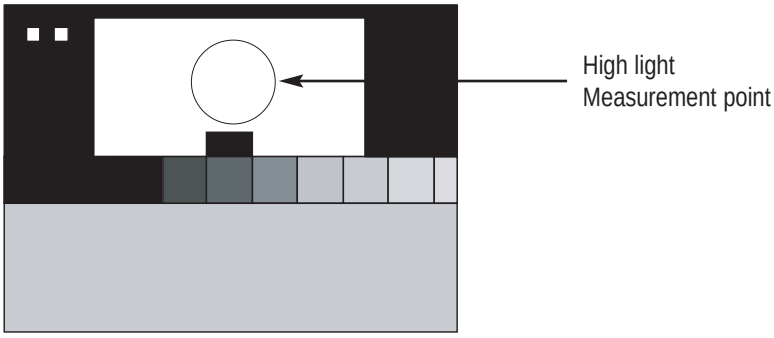
* Do not adjust green offset data.



Picture 2-3 Toshiba ABL Pattern

d) Adjust the high light. (Refer to Picture 2-4 for measurement point.)

- Do not adjust the 'Y' value of high light.
- Select DNIe Lite menu.
- Adjust CB5 HIGH('y') and CR5 HIGH('x') to the color coordinates

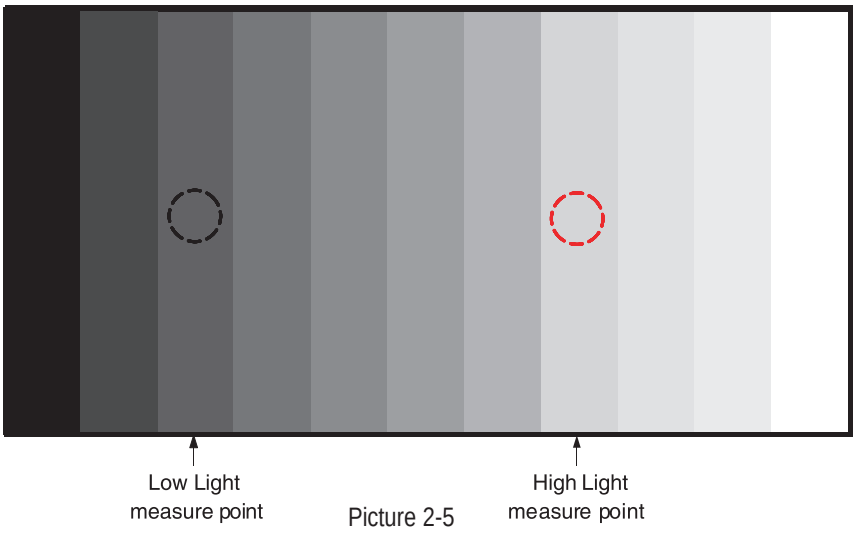


Picture 2-4 Toshiba ABL Pattern

3-4-4 How to adjust White Balance with 10 steps gray pattern

1. If you don't have Toshiba ABL pattern, you can adjust white balance with 10 steps gray scale pattern of Picture 2-5.

2. When you measure Low Light, use 20 IRE portions.
   And When you measure High Light, use 70 IRE portion. But if color noise is less in 60 IRE than in 70 IRE, 60 IRE is allowed as a measure point.



Picture 2-5

• Pattern Used in Adjustment : 10 Steps Gray scale pattern.

3. Perform adjustments 2-b through 2-d from previous page using the 10 step gray scale pattern.

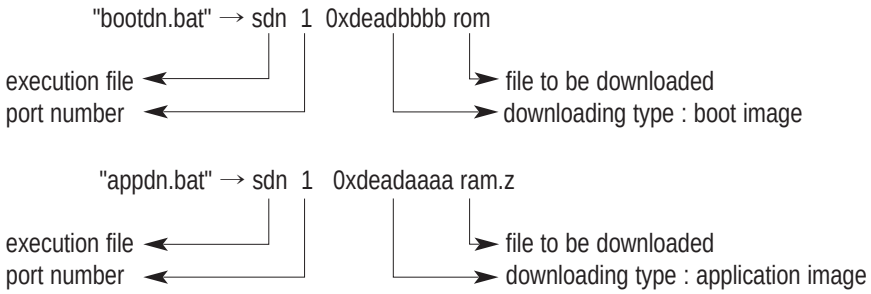
3-5 Software Upgrade

3-5-1 Source Program Download & Generals

1. Downloading boot code
   (1) Turn off PDP-TV.
   (2) Connect the RS-232 serial cable to the service jack of PDP-TV.
   (3) Enter the DOS Mode and move to the directory including "bootdn.bat" and Excute the file.
   (4) Turn on PDP-TV.

2. Downloading application code
   (1) Turn off PDP-TV.
   (2) Connect the RS-232 serial cable to the service jack of PDP-TV.
   (3) Enter the DOS Mode and move to the directory including "appdn.bat" and Excute the file.
   (4) Power on PDP-TV.

■ Changing RS-232 serial port and downloaded file
   If you want to change serial port, you must edit "bootdn.bat" and "appdn.bat".



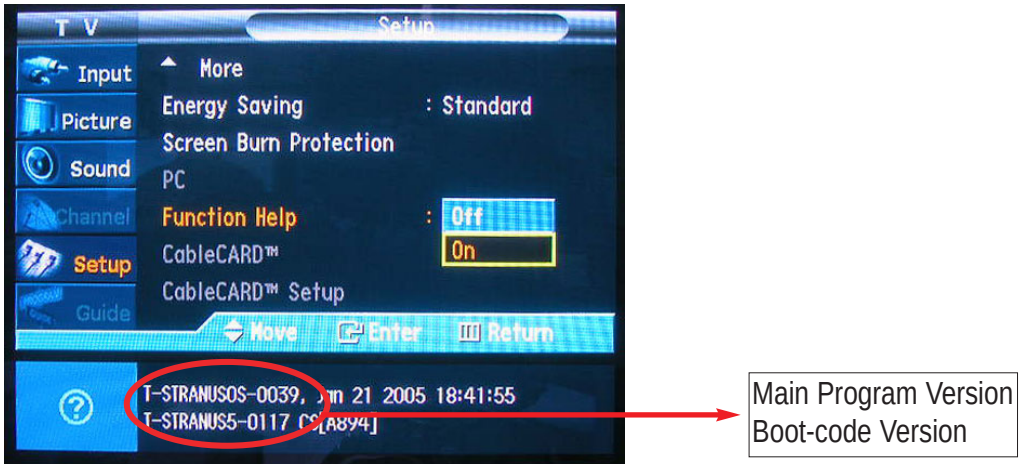
1. Don' t turn off during downloading.

2. sdn.exe, download file and Batch file should be in the same directory.

3. During Downloading, Hyper Terminal should be turned off.
   (2) Enter a new name.
   (3) Select a modem port.(com 1 and direct connection.)
   (4) Set the bit/second to 115200.
   (5) Set the data bit to 8
   (6) No parity bit.
   (7) Set stop bit to 1.
   (8) No flow control.
   (9) Save in memory.
   (10) At this point, the new hyper terminal is ready.

3-5-2 How to Check the Version of the Program

1. Procedures for checking in the User Menu
   - Select the "Setup" menu in the Menu screen
   - Place the cursor over the "On" of "Function Help", and press the "Info" key on the remote control
   - The version of the program is displayed at the bottom of the Menu screen



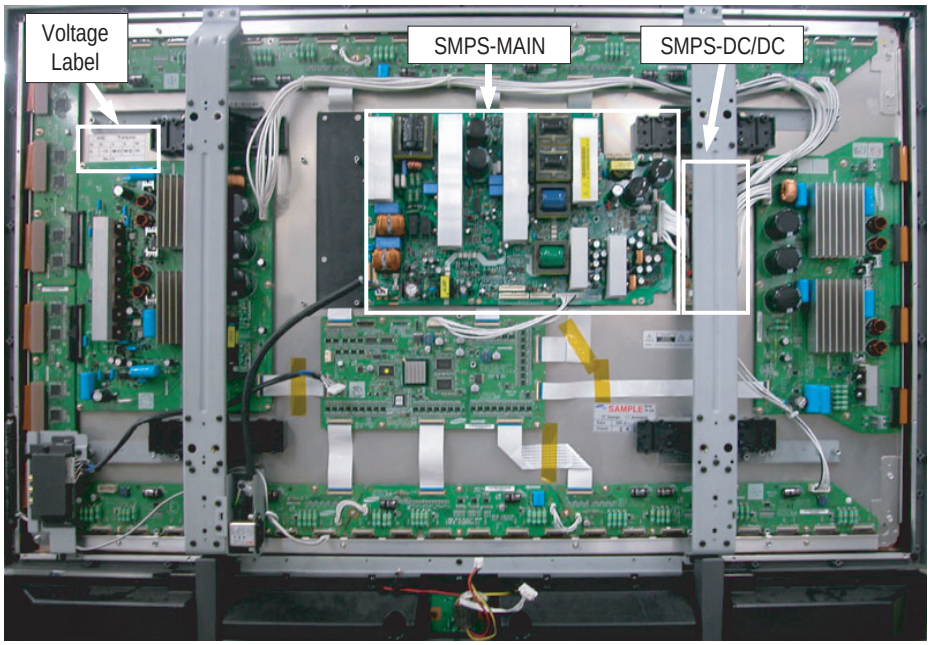
2. Procedures for checking in the Factory Menu
   When entering Factory Mode, the version of the software is displayed at the bottom of the menu as described on page 3-2.

3-6 Replacements & Calibration

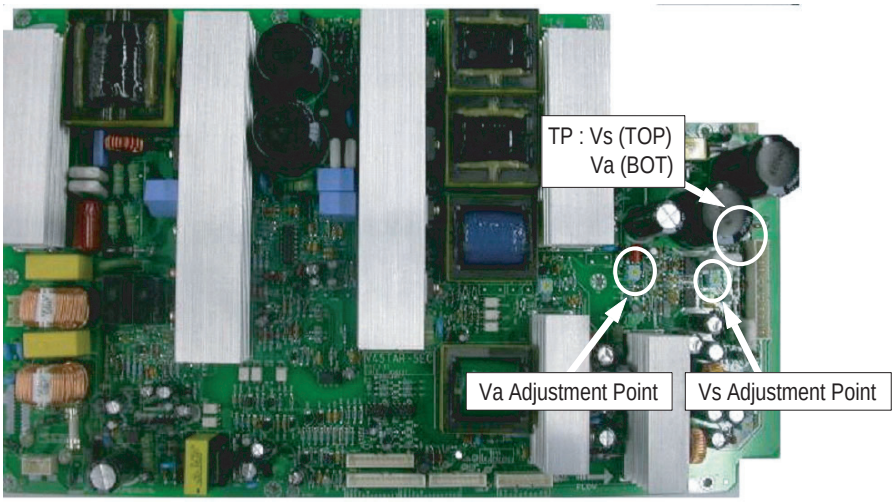
3-6-1 Voltage Adjustment

1. SMPS Panel voltages must be adjusted after changing SMPS-PCB or PDP module.

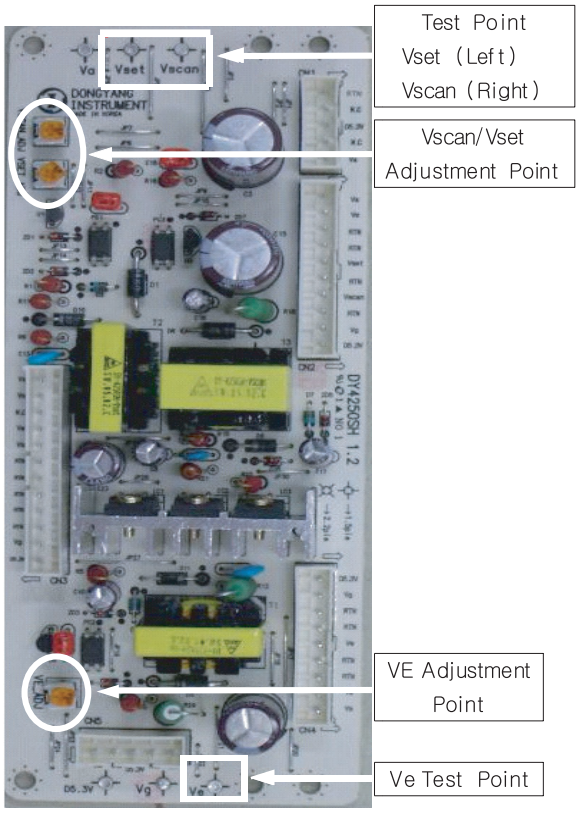
	Range	Board Adjustment
Vs	190~220V	SMPS-MAIN
Va	60~80V	
Vset	180~210V	SMPS-DC/DC
Ve	80~120V	
Vscan	-160~210V	



2. A point of adjusting SMPS-MAIN voltage.



3. A point of adjusting SMPS-DC/DC.



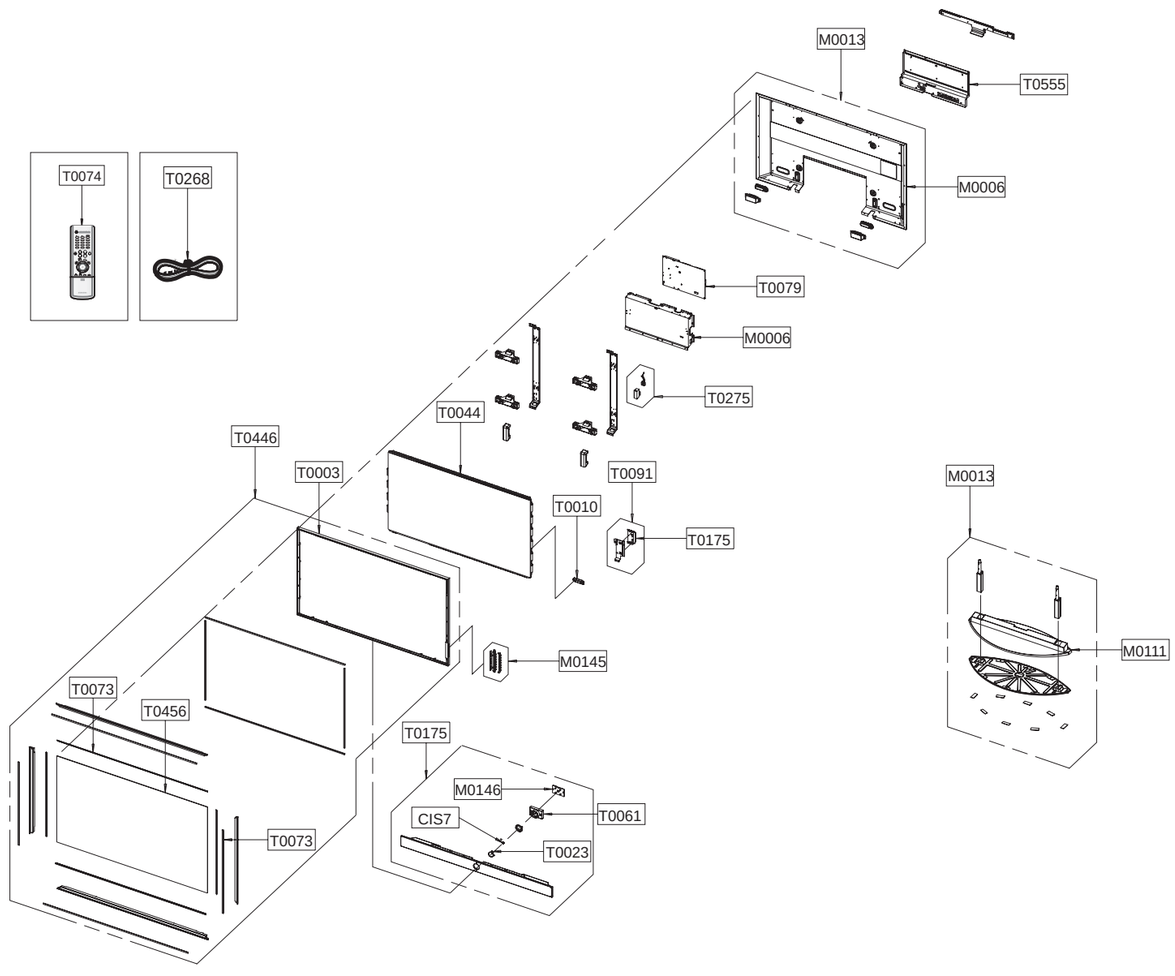
* Use base chassis of PDP panel as GND point.

MEMO

4. Exploded View & Part List

4-1 PL50P5HDX/XAX

You can search for the updated part code through ITSELF web site.
URL:http://itself.sec.samsung.co.kr



Loc. No.	Code No.	Description	Specification	Q'ty	SA/SNA	Remark
CIS7	AA61-60003B	SPRING ETC-CS	-,SUS304,-,-,OD11.2,N7,OD1	1	S.N.A	
M0006	BN63-01688A	COVER-REAR	50P5,PCM,T0.5,COLOR STILL	1	S.N.A	
M0006	BN63-01634B	COVER-REAR SUB	SP-R4232,SECC,T1.0	1	S.N.A	
M0013	BN96-01939E	ASSY STAND P-BASE	50P5,XAC,HIPS HB,BK07,	1	S.A	
M0013	BN96-01790D	ASSY COVER P-REAR	50P5,PCM,T0.5	1	S.A	
M0111	BN63-01834G	COVER-STAND	50P5H,XAC,HIPS,T3.5,HB,BK07,	1	S.N.A	
M0145	BN96-02549A	ASSY BOARD P-FUNCTION	SCHUBERT,CT5000-37	1	S.A	
M0146	BN96-02050E	ASSY BOARD P-POWER & IR	SCHUBERT,CT5000-	1	S.A	
T0003	BN96-02686E	ASSY COVER P-FRONT	50P5,XAX,HIPS HB,BKN-	1	S.A	
T0010	BN61-01533A	HOLDER-AV	SPD-50P5HD,ABS	1	S.N.A	
T0023	BN64-00336A	KNOB POWER	42P5,PC,VIOLET	1	S.N.A	
T0044	BN96-03082A	ASSY PDP MODULE P	M1,PL50HW005B,V5.0,136	1	S.A	
T0061	BN64-00338A	WINDOW-REMOCON	42P5,ACRYL,5%	1	S.N.A	
T0073	AA63-01127A	GASKET-EMI	50P5,AL FOIL,T1.5,7mm,1177mm	2	S.N.A	
T0073	AA63-01128A	GASKET-EMI	50P5,AL FOIL,T1.5,7mm,702mm	2	S.N.A	
T0074	BN59-00462A	REMOCON	STRAUSS,TM76A,200*54*30,ZILOG,54	1	S.A	
T0079	BN94-00860A	ASSY PCB MISC-MAIN	HP-R5072CF,D71C,V5	1	S.A	
T0091	BN94-00647A	ASSY PCB MISC-SIDE A/V	SPD-42P5HD,D71A,4	1	S.A	
T0175	BN96-01738B	ASSY SPEAKER P	8ohm,P5,50,15W,Urethan co	1	S.A	
T0175	BN63-01015B	SHIELD-AV JACK	50P5,SECC,T0.5	1	S.N.A	
T0268	3903-000144	CBF-POWER CORD	DT,US,BP3/Y,U(IEC C13-RA)	1	S.A	
T0275	BN96-02369A	ASSY MISC P-INLET	HP-R4252,STRAUSS,DOCUM	1	S.N.A	
T0446	BN96-02703K	ASSY BRACKET P-FRONT	50P5(NEW),XAX,MRT G	1	S.A	
T0456	BN67-00156A	GLASS-FILTER EMI	50 P5,Mesh,NTR,40%,1224	1	S.N.A	
T0555	BN96-02877C	ASSY MISC P-BRKT TERMINAL	42P5,50P5,XAA,	1	S.N.A	

5. Electrical Part List

5-1 PL50P5HDX/XAX Service Item

You can search for the updated part code through ITSELF web site.
URL:http://itself.sec.samsung.co.kr

Loc. No.	Code No.	Description	Specification	Q'ty	SA/SNA	Remark
M0013	BN96-01790D	ASSY COVER P-REAR	50P5,PCM,T0.5	1	S.A	
M0013	BN96-01939E	ASSY STAND P-BASE	50P5,XAC,HIPS HB,BK07,	1	S.A	
M2893	BN39-00454D	LEAD CONNECTOR	Schubert,UL1185/2547#26,U	1	S.A	
M2893	BN39-00632A	LEAD CONNECTOR	HPR4252,UL1617#22,UL/CSA,	1	S.A	
M2893	BN39-00667A	LEAD CONNECTOR-LVDS	SCHUBERT,UL20276#30,	1	S.A	
M2893	BP39-00053A	LEAD CONNECTOR	P57A/SVP-55WHT,UL1007#26,	1	S.A	
M2893	MD39-00074B	LEAD CONNECTOR	P57A/SVP-55W9HT,UL1007#26	1	S.A	
T0003	BN96-02686E	ASSY COVER P-FRONT	50P5,XAX,HIPS HB,BKN-	1	S.A	
T0044	BN96-03082A	ASSY PDP MODULE P	M1,PL50HW005B,V5.0,136	1	S.A	
T0074	BN59-00462A	REMOCON	STRAUSS,TM76A,200*54*30,ZILOG,54	1	S.A	
T0079	BN94-00860A	ASSY PCB MISC-MAIN	HP-R5072CF,D71C,V5	1	S.A	
T0128	BN39-00518A	CBF SIGNAL-STEREO	NA32KO,1P,UL2464#26,20	1	S.A	
T0159	BN96-01801B	ASSY PCB P-SMPS	SPD-50P5HDM,100~240V,395	1	S.A	
T0159	BN96-01856A	ASSY PCB P-SMPS	SPD-50P5HD(DC_DC),200Vin	1	S.A	
T0175	BN96-01738B	ASSY SPEAKER P	8ohm,P5,50,15W,Urethan co	1	S.A	
T0446	BN96-02703K	ASSY BRACKET P-FRONT	50P5(NEW),XAX,MRT G	1	S.A	
T0568	BN39-00602B	CBF IF	SPR4232,1P,1365#26,200mm,BLK,DIN(	1	S.A	
T1910	BN96-03090A	ASSY PDP MODULE P-X-MAIN BOARD	M1,PL50HW	1	S.A	
T1911	BN96-03091A	ASSY PDP MODULE P-Y-MAIN BOARD	M1,PL50HW	1	S.A	
T1912	BN96-03092A	ASSY PDP MODULE P-Y-UPPER SCAN	M1,Y-UPPE	1	S.A	
T1913	BN96-03093A	ASSY PDP MODULE P-Y-LOWWER SCA	M1,Y-LOWW	1	S.A	
T1914	BN96-03094A	ASSY PDP MODULE P-ADDRESS E-BU	M1,addres	1	S.A	
T1915	BN96-03095A	ASSY PDP MODULE P-ADDRESS F-BU	M1,addres	1	S.A	
T1916	BN96-03096A	ASSY PDP MODULE P-ADDRESS G-BU	M1,addres	1	S.A	
T1917	BN96-03097A	ASSY PDP MODULE P-LOGIC BOARD	M1,logic b	1	S.A	

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6. Troubleshooting

6-1 First Checklist for Troubleshooting

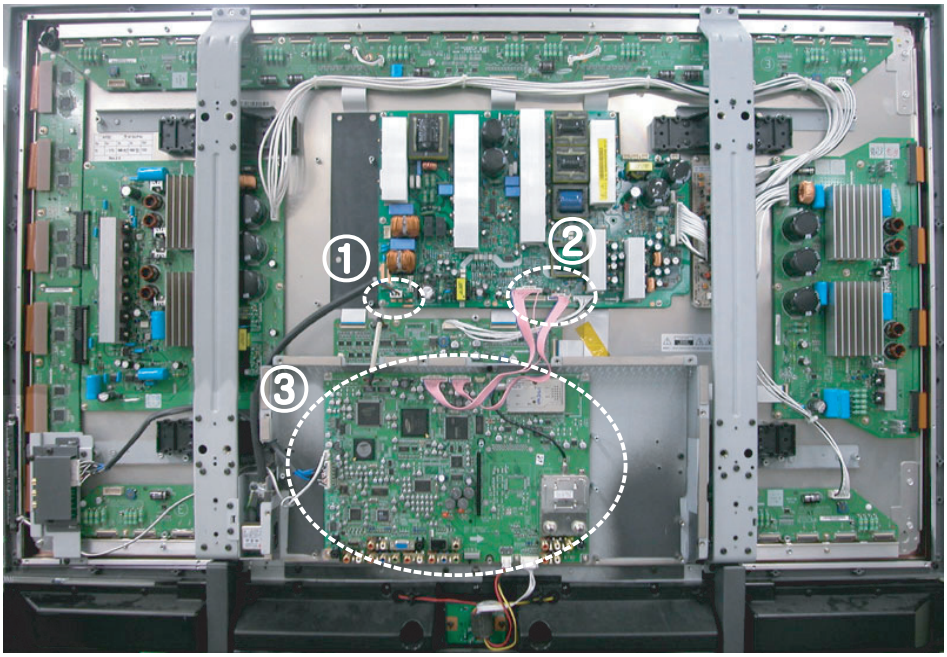
1. Check the various cable connections first.
   - Check to see if there is a burnt or damaged cable.
   - Check to see if there is a disconnected cable connection or a connection is too loose.
   - Check to see if the cables are connected according to the connection diagram.

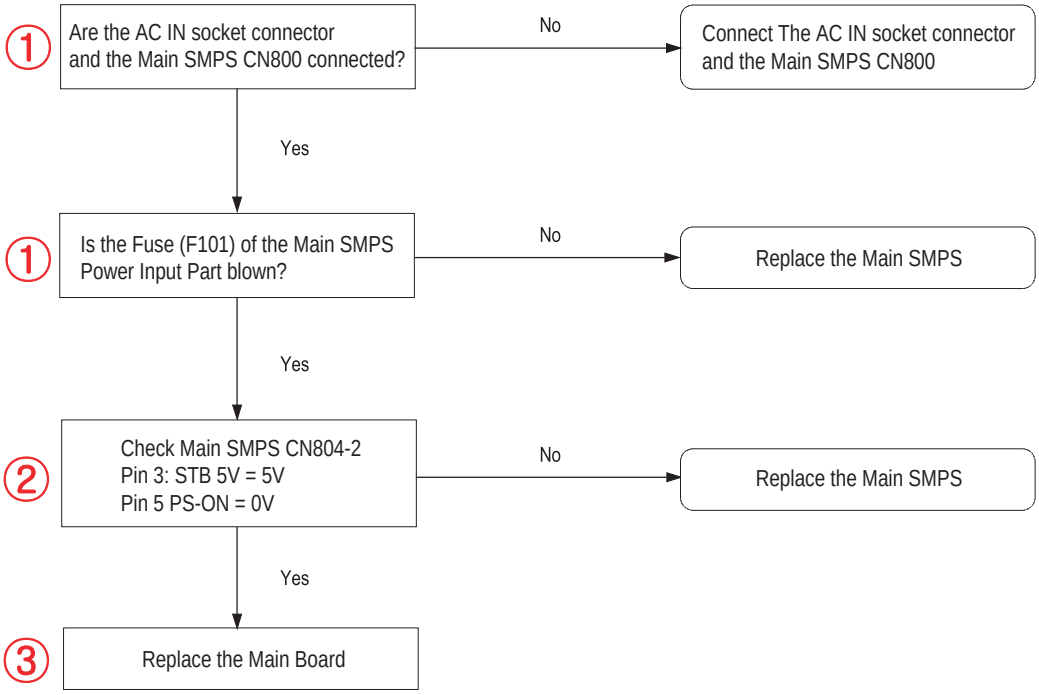
2. Check the power input to the Main Board.

3. Check the voltage in and out between the SMPS ↔ Main Board, between the SMPS ↔ X, Y Drive Board, and between the Logic Boards.

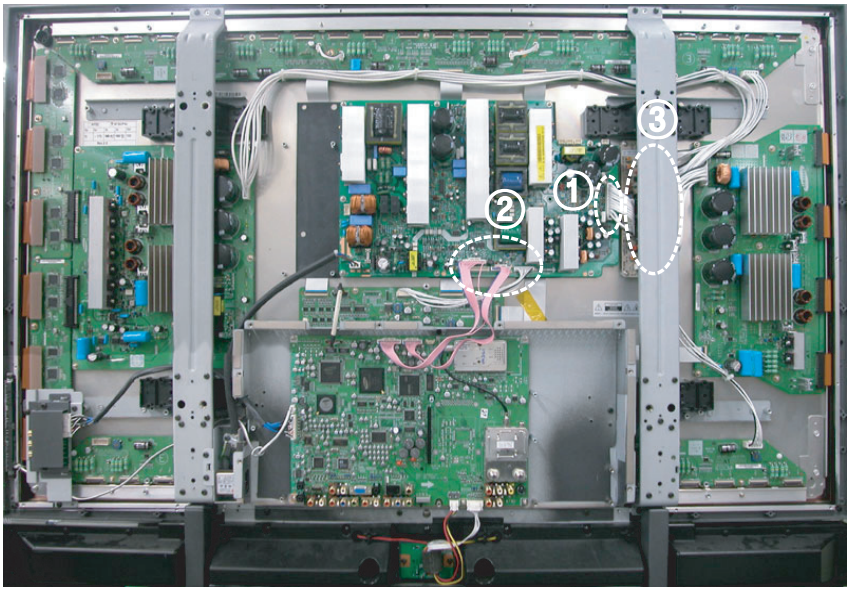
6-2 Checkpoints by Error Mode

6-2-1 No Power

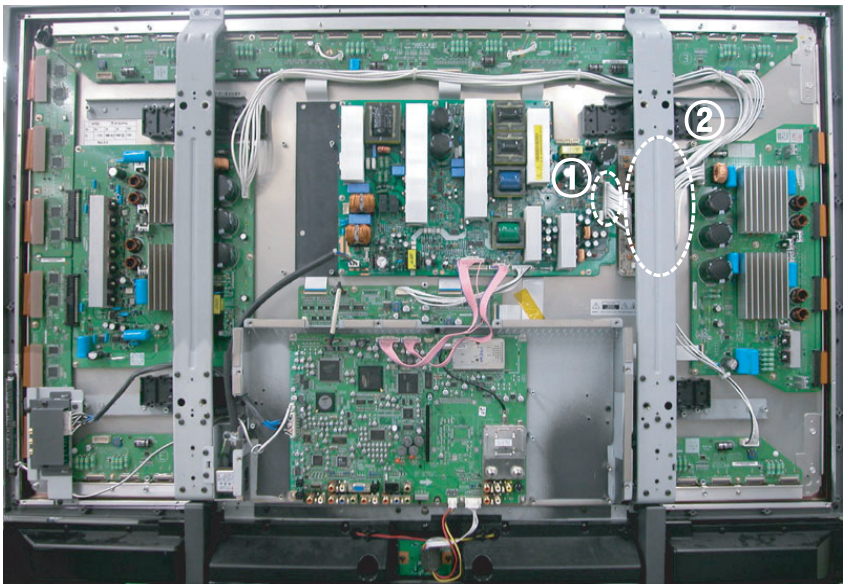
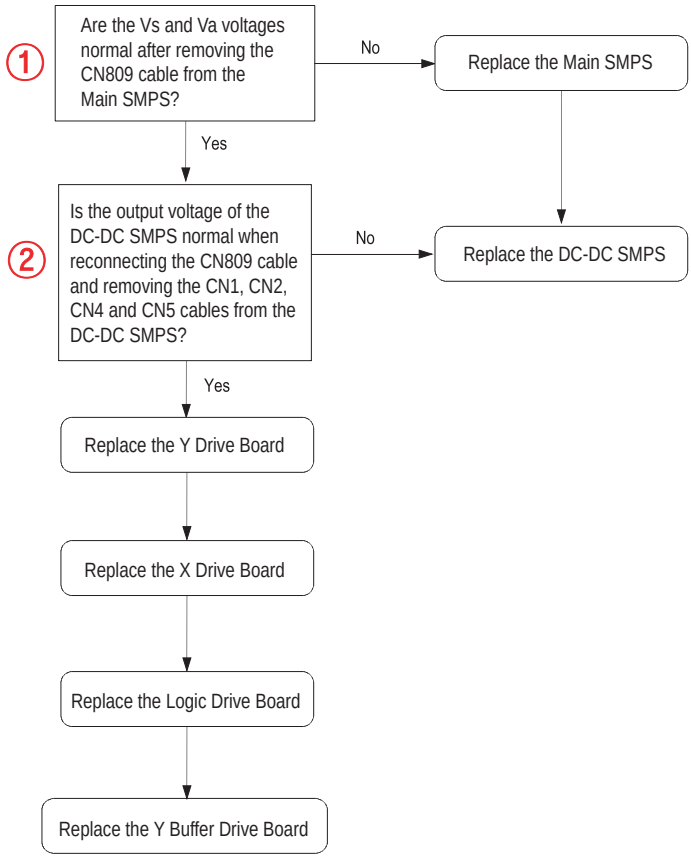
Symptom	- The LEDs on the front panel do not work when connecting the power cord. - The SMPS relay does not work when connecting the power cord. - The power of the unit seems to be out of order.
Major Checklist	The SMPS relay or the LEDs on the front panel do not work when connecting the power cord if the cables are improperly connected or the Main Board or SMPS is out of order. In this case, check the following: - Check the internal cable connection status inside the unit. - Check the fuses of each part. - Check the output voltage of SMPS. - Replace the Main Board.
Troubleshooting Procedures	



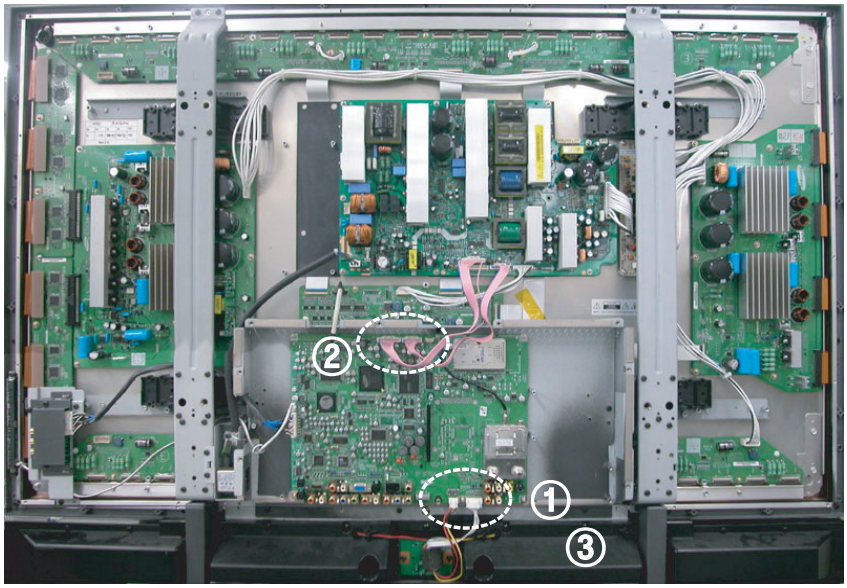
6-2-2 When the unit is repeatedly turned on and off

Symptom	- The SMPS relay is repeatedly turned on and off.
Major Checklist	In general, the SMPS relay repeatedly turns on and off by the protection function due to a defect on a board connected to the SMPS. - Disconnect all cables from the SMPS, operate the SMPS alone and check if the SMPS works properly and if each voltage output is correct. - If the symptom continues even when SMPS is operated alone, replace the SMPS. - If the symptom is not observed when operating the SMPS alone, find any defective ASSYs by connecting the cables one by one.
Troubleshooting Procedures	 ① Does the symptom continue after connecting the power and removing CN809 cable from the Main SMPS? No → ③ Does the symptom continue when connecting the power after connecting the CN809 cable and removing the CN1, CN2, CN4 and CN5 cables from the DC-DC SMPS? Yes → Replace the DC-DC SMPS Yes → ② Does the symptom continue when separating the CN804-2 and CN803 cables from the Main SMPS and shorting pins 4 and 5 of the CN804-2 Connector? No → Replace the Main Board Yes → Replace the Main SMPS No → ③ Reconnect all cables. Does the symptom continue when connecting the power after the CN4 cable to the DC-DC SMPS? Yes → Replace the X Drive Board No → ③ Does the symptom continue when connecting the power after CN2 to the DC-DC SMPS? Yes → Replace the Y Drive Board No → ② Does the symptom continue when connecting the power after removing CN810 from the Main SMPS? No → Replace the Logic Drive Board
Caution	When separating and connecting the cables such as CN809 of the Main SMPS, CN1, CN2, CN3, CN4 and CN5 of DC-DC SMPS, CN of the X Drive Board, and CN of the Y Drive Board, a spark may be generated by the electric charge of the high capacity capacitor. Therefore, wait some time after separating the power cord from the unit.

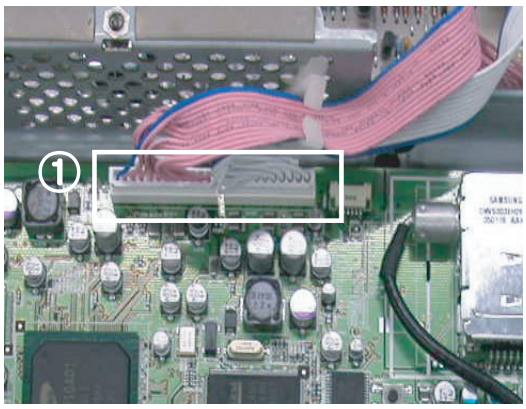
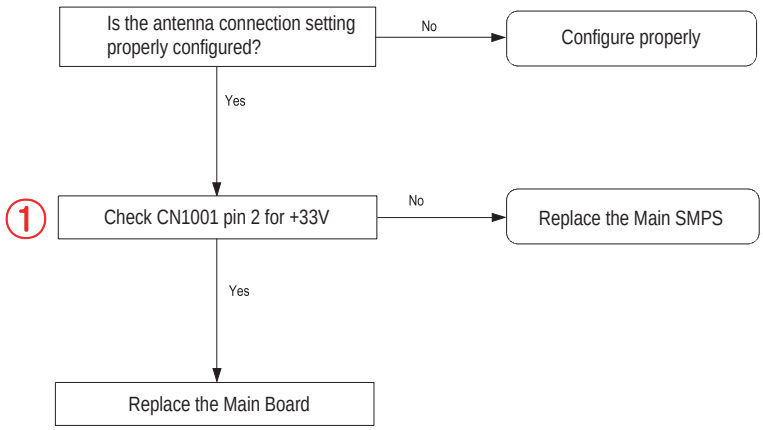
6-2-3 No Picture (When audio is normal)

Symptom	- Audio is normal but no picture is displayed on the screen.
Major Checklist	- This may happen when the Video Board is normal but the X, Y Drive Board, Logic Board, or Y Buffer Boards are out of order. - The output voltage of the Main SMPS or the DC-DC SMPS is out of order. - This may happen when the LVDS cable connecting the Main Board and the Logic Board is disconnected.
Troubleshooting Procedures	 
Caution	When separating and connecting the cables such as CN809 of the Main SMPS, CN1, CN2, CN3, CN4 and CN5 of the DC-DC SMPS, CN of the X Drive Board, and CN of the Y Drive Board, a spark may be generated by the electric charge of the high capacity capacitor. Therefore, wait some time after separ ating the power cord from the unit.

6-2-4 No Sound

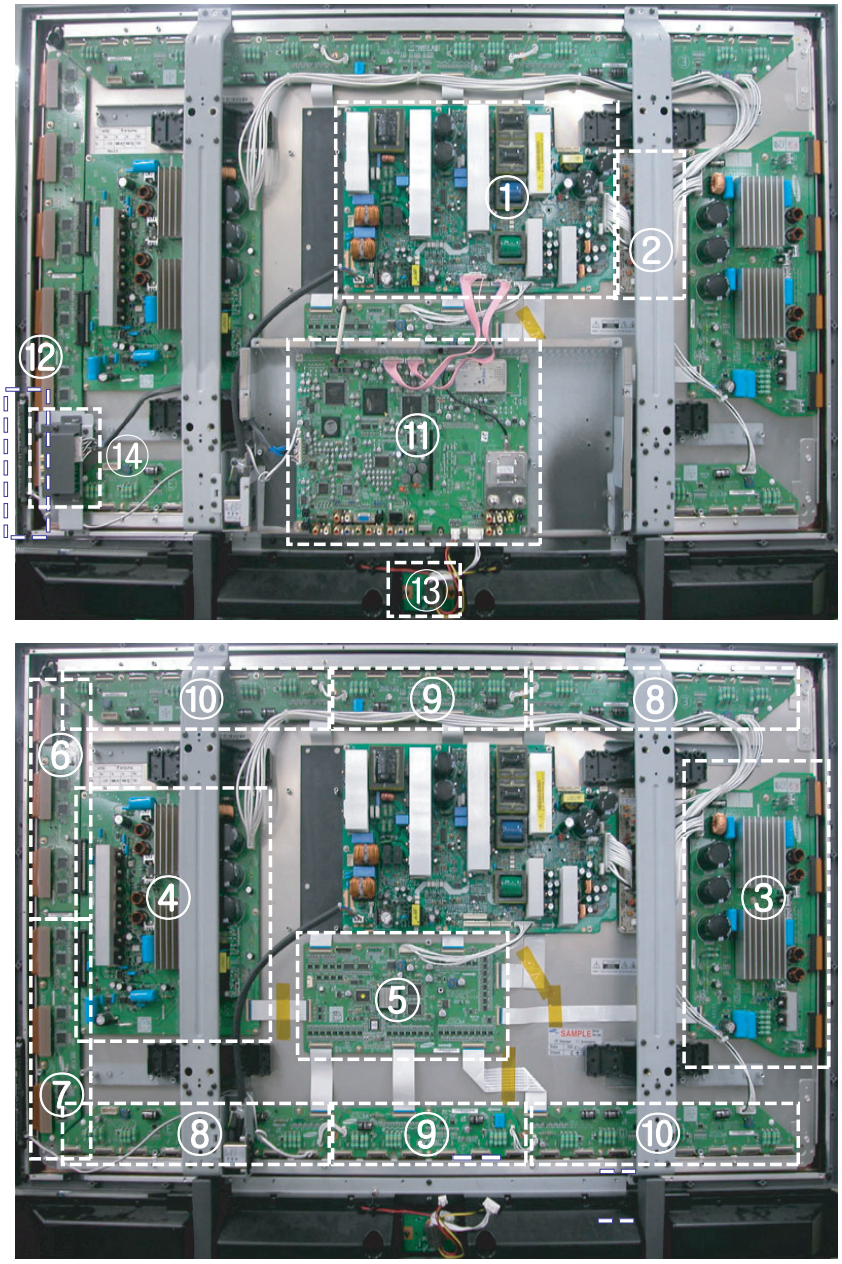
Symptom	- Video is normal but there is no sound.
Major Checklist	- When the speaker connectors are disconnected or damaged. - When the sound processing part of the Video Board is out of order. - Speaker defect.
Troubleshooting Procedures	 ① Is the cable connection between the main Board and the speaker properly connected? — No → Connect the cable properly or replace the cable, if necessary. Yes ② Is the output voltage of SMPS normal? (CN803 #6) — No → Replace the main SMPS Yes Is the speaker output terminal of the Main Board normal? — No → Replace the Main Board Yes ③ Replace the Speaker

6-2-5 No Video

Symptom	- A normal/cable network analog broadcast screen is blank or abnormal.
Major Checklist	- Check the antenna connection settings (Antenna 1 - Normal/Cable/DTV, Antenna 2 - Only for DTV) - Check the tuner output signal (CVBS). - Check the power input of the Main board.
Troubleshooting Procedures	 

6-3 Troubleshooting Procedures by ASS'Y

No	Assy	Code No.	Description	Major Symptoms
1	ASSY PCB P-SMPS	BN96-01801B	Main SMPS	No power, Blank screen, the Relay repeats On and Off.
2	ASSY PCB P-SMPS	BN96-01856A	DC-DC SMPS	Blank screen, the Relay repeats On and Off.
3	ASSY PDP P-X MAIN BOARD	BN96-03090A	X Drive Board	Blank screen.
4	ASSY PDP P-Y MAIN BOARD	BN96-03091A	Y Drive Board	Blank screen.
5	ASSY PDP P-LOGIC BOARD	BN96-03097A	Logic Board	Blank screen, Screen noise.
6	ASSY PDP P-Y BUFF UPPER BOARD	BN96-03092A	Y Buffer Upper Board	Upper screen is blank.
7	ASSY PDP P-Y BUFF LOWER BOARD	BN96-03093A	Y Buffer Lower Board	Lower screen is blank.
8	ASSY PDP P-ADDRESS E-BUFF BOARD	BN96-03094A	Address E Buffer Board	Corresponding Buffer Board block screen is blank.
9	ASSY PDP P-ADDRESS F-BUFF BOARD	BN96-03095A	Address F Buffer Board	Corresponding Buffer Board block screen is blank.
10	ASSY PDP P-ADDRESS G-BUFF BOARD	BN96-03096A	Address G Buffer Board	Corresponding Buffer Board block screen is blank.
11	ASSY PCB MISC-MAIN	BN94-00860A	Main Board	No Power, Abnormal screen for each input source, PIP screen trouble, Sound trouble.
12	ASSY FUNCTION	BN96-02549A	Function Key Board	The side function key does not work properly.
13	ASSY POWER	BN96-02050E	Power Button Board	The remote control does not work properly, the LED does not work properly.
14	ASSY PCB MISC-SIDE AV	BN94-00647A	Side AV Board	The AV2 and S-VIDEO2 modes do not work properly.



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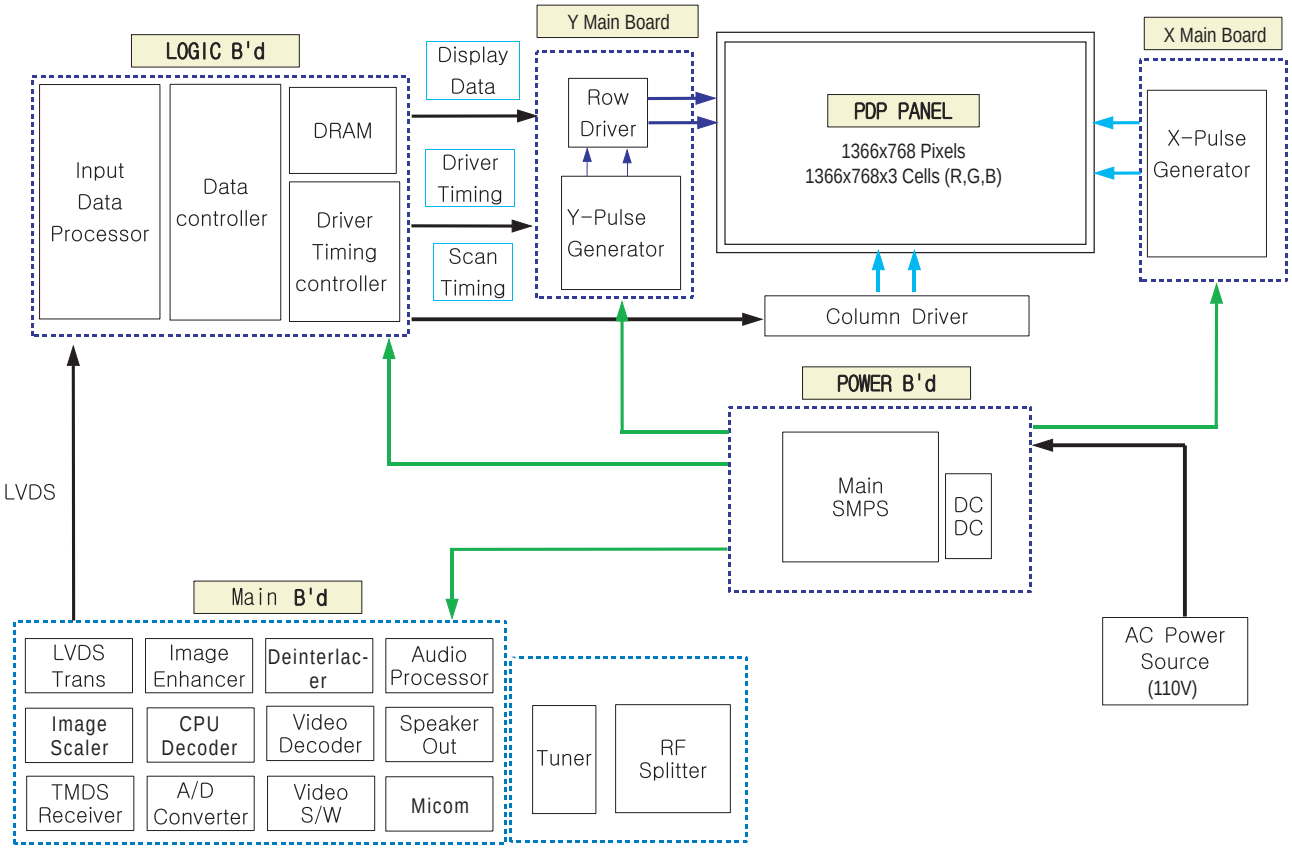
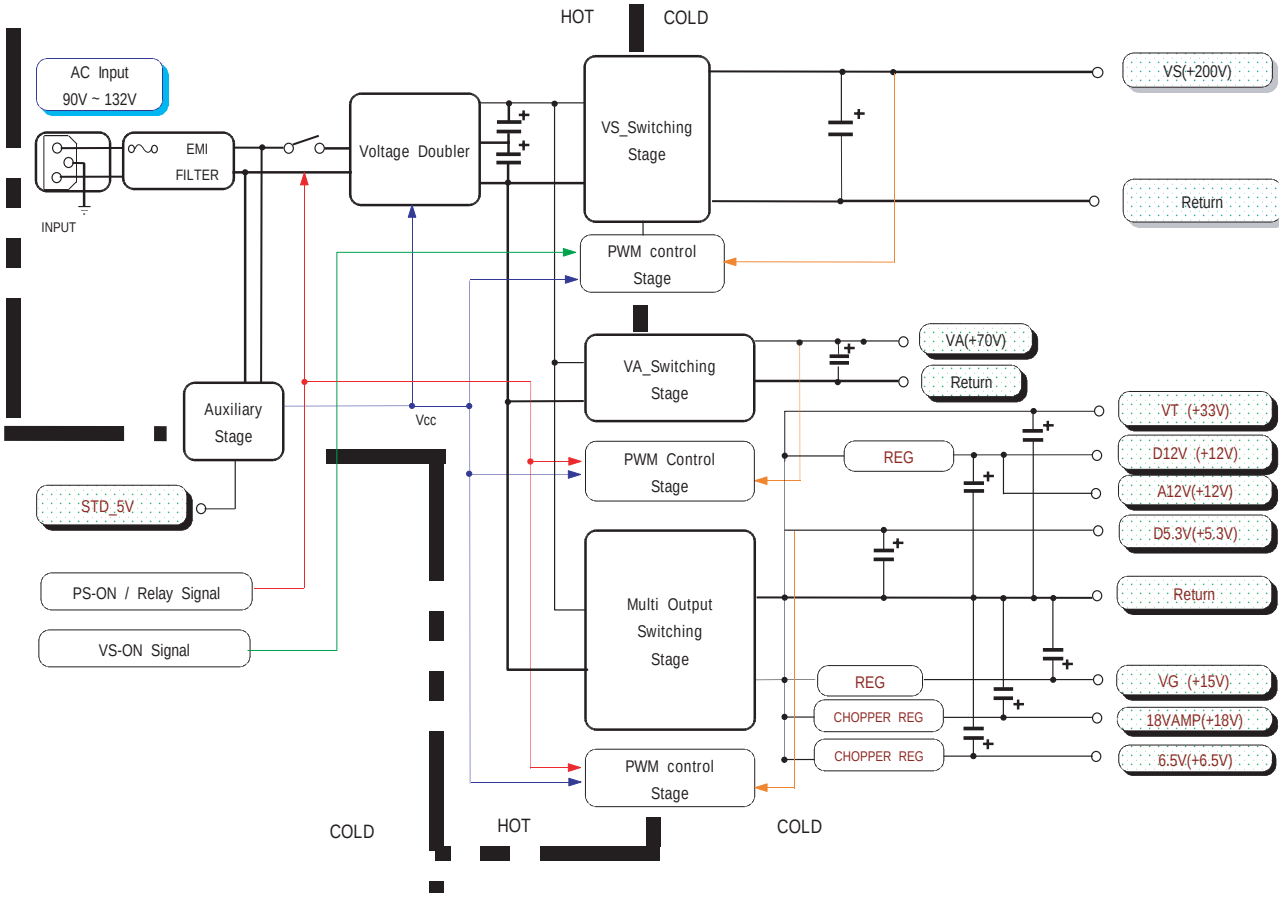
7. Block Diagram

7-1 Overall Block Diagram

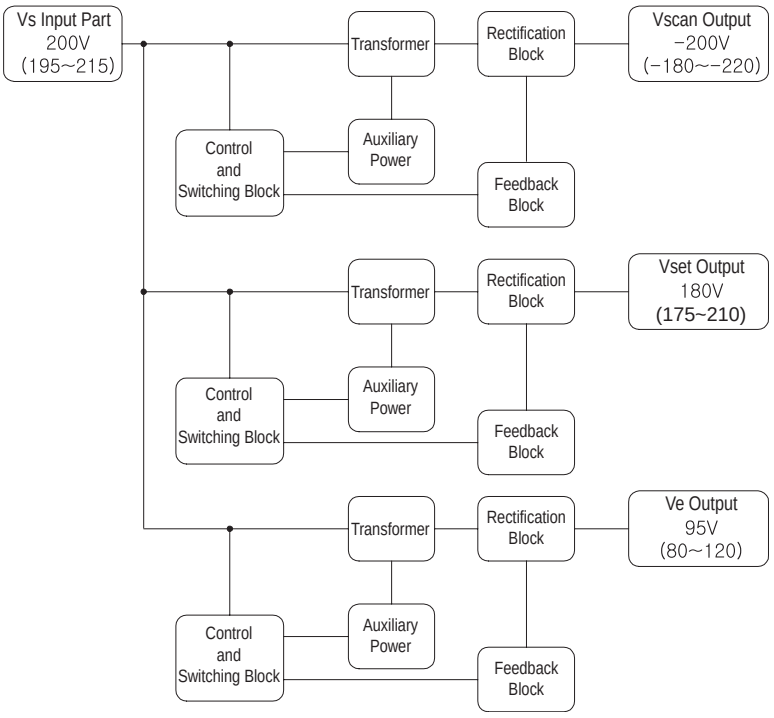


7-2 Partial Block Diagram

7-2-1 Main SMPS Block Diagram

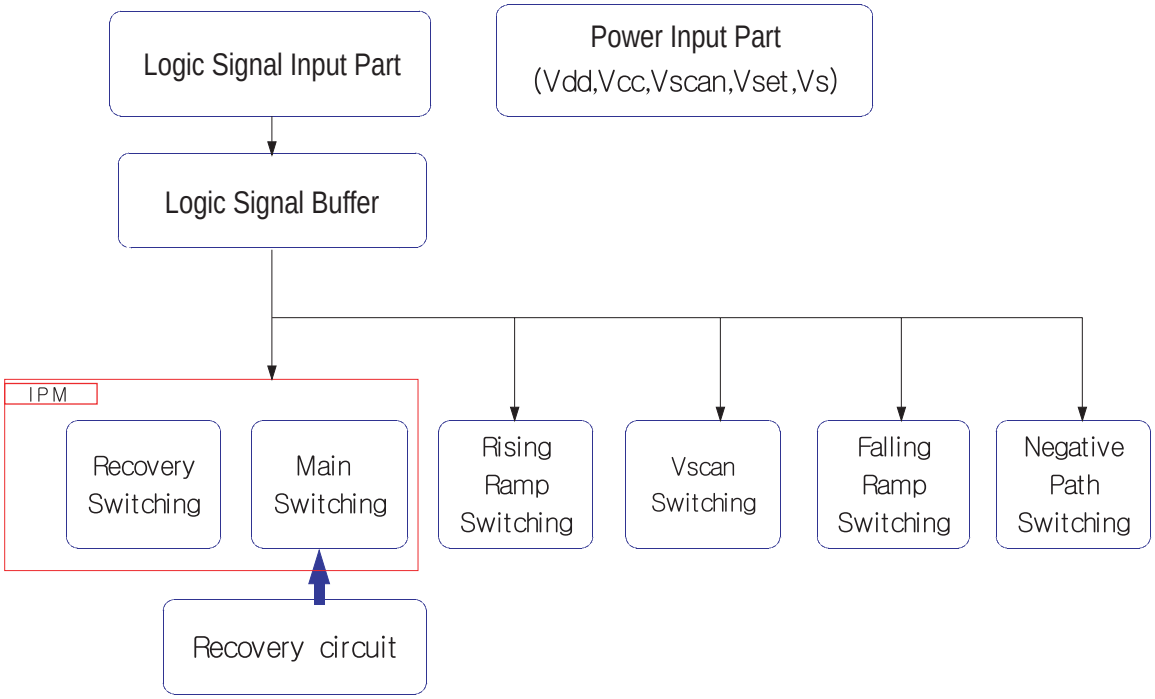


7-2-2 DC-DC SMPS Block Diagram

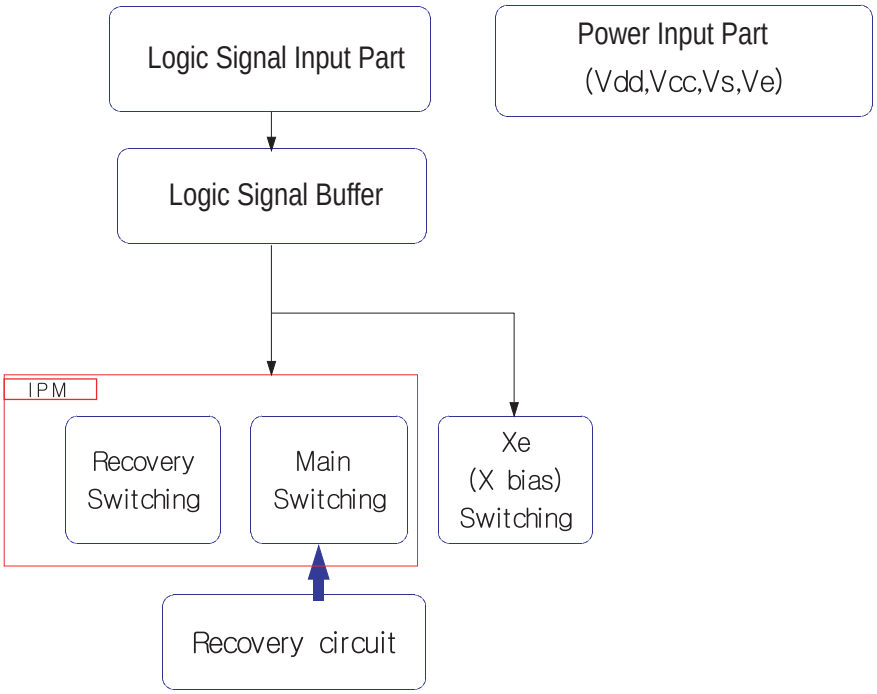


7-2-3 Module Driver Board Block Diagram

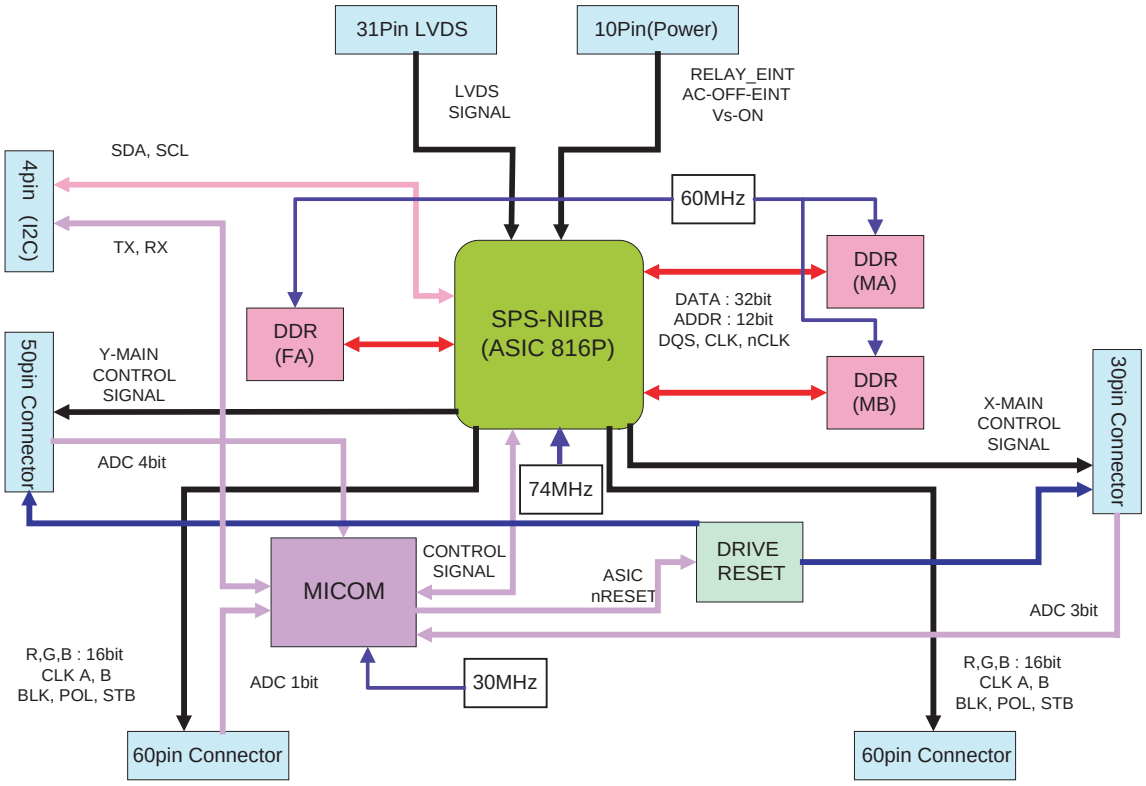
1. Y Main Board



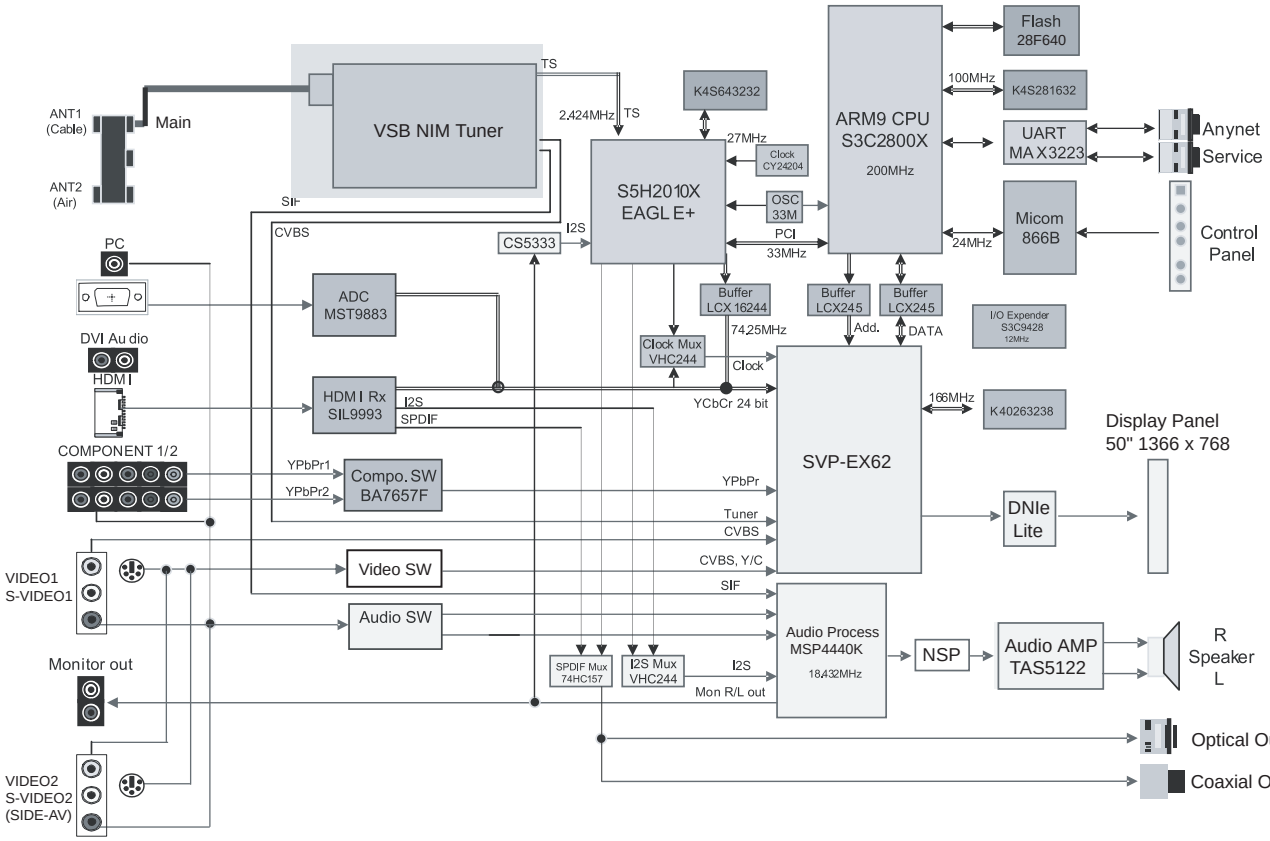
2. X Main Board



7-2-4 Logic Board Block Diagram

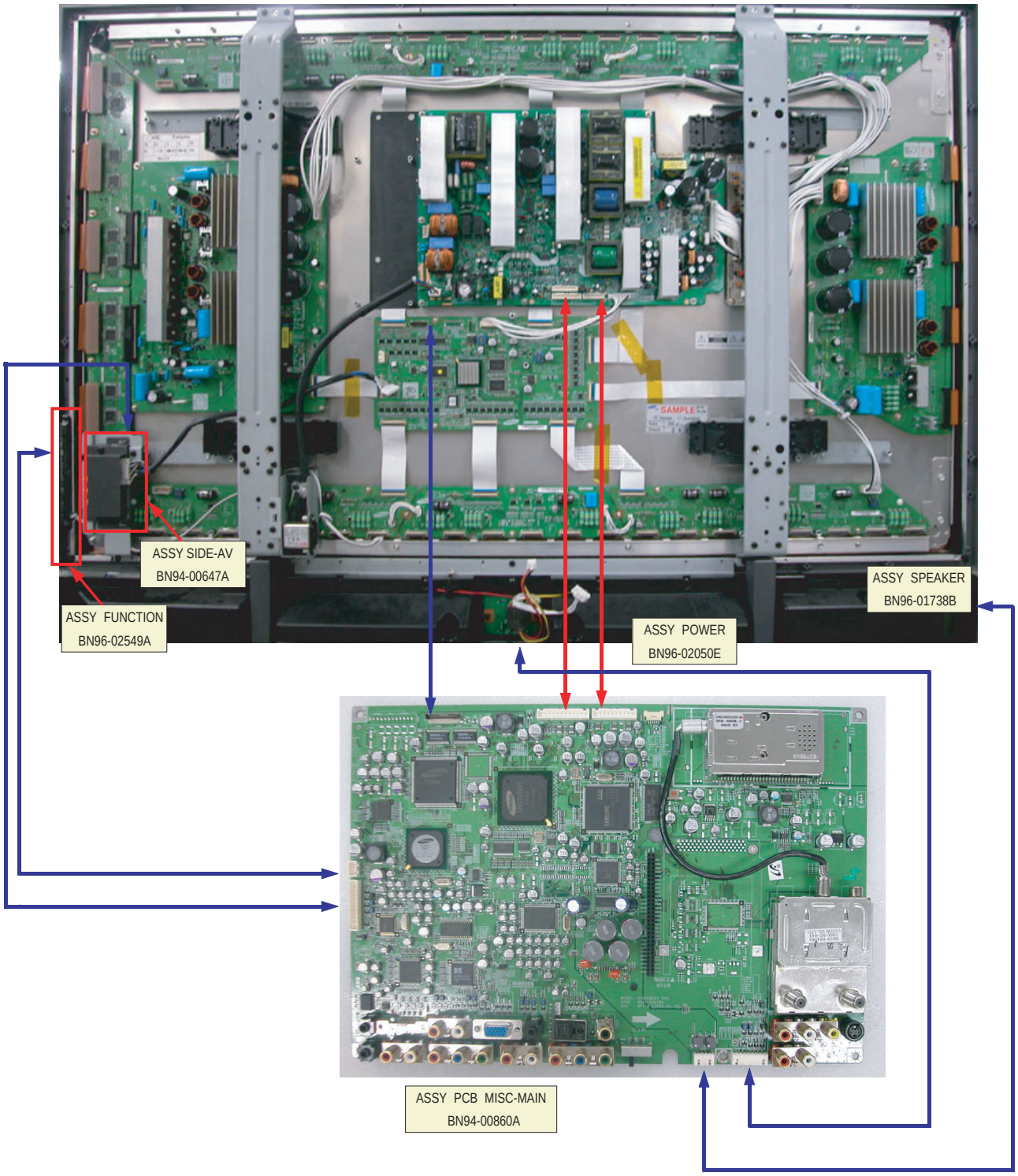


7-2-5 Main Board Block Diagram

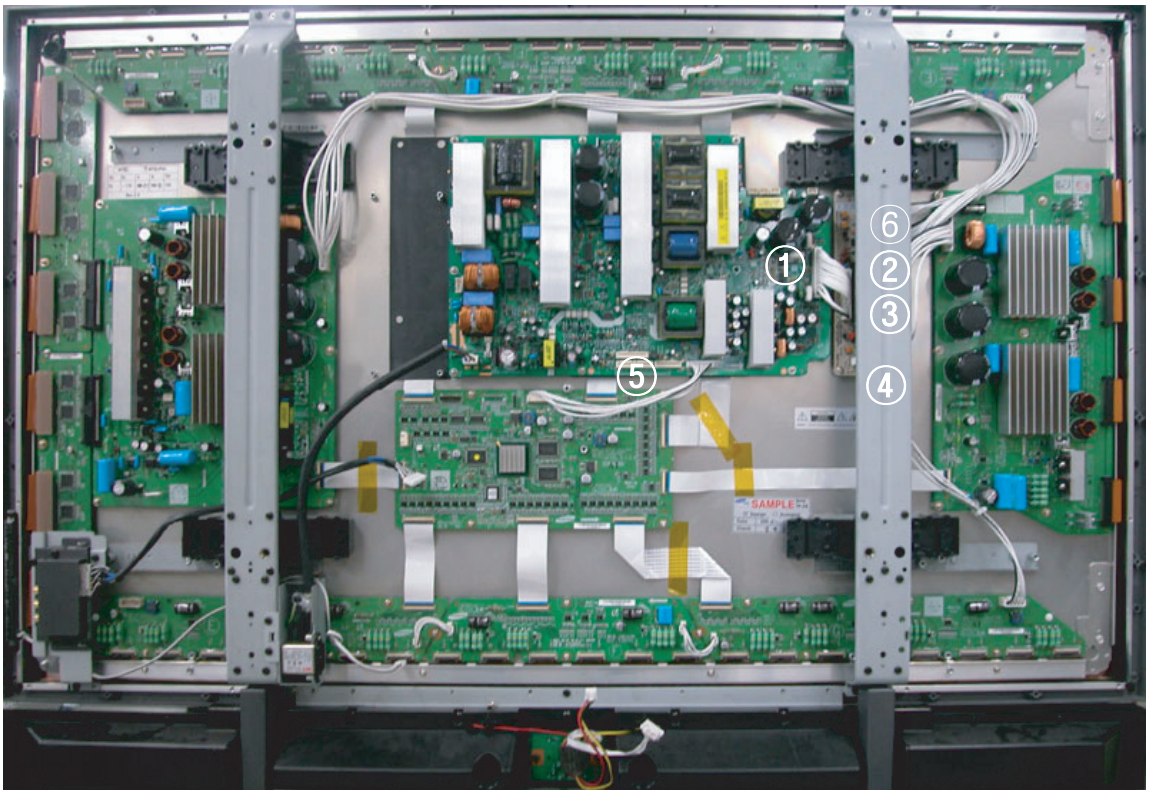


8. Wiring Diagram

8-1 Overall Wiring



8-1-1 PDP Module ↔ SMPS Wiring



① CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N.C
11	Vs
12	Vs

②, CN2(DC-DC SMPS) ↔ CN5007(Y B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Vset
6	RTN
7	Vscan
8	RTN
9	Vg
10	5.3V

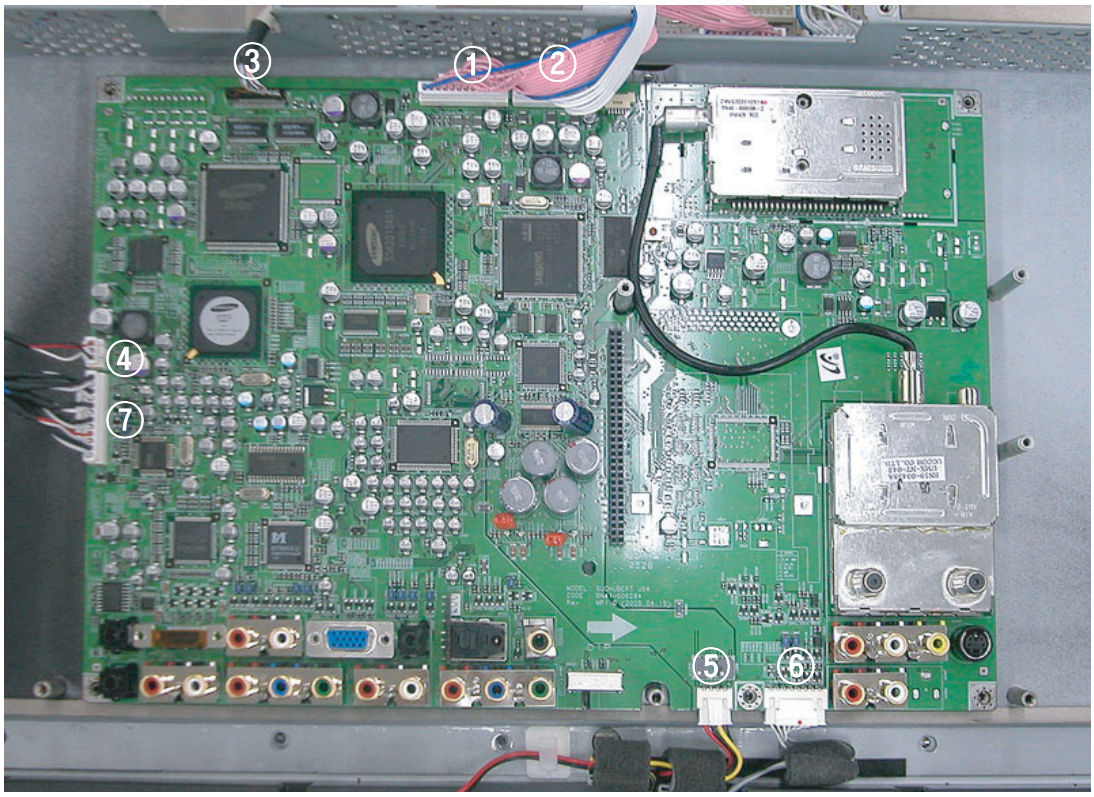
③ CN4(DC-DC SMPS) ↔ CN4000(X B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Ve
6	RTN
7	RTN
8	Vg
9	5.3V

④ CN5(DC-DC SMPS) ↔ CN2710(BOT G-Buf)	
Pin No	Signal
1 ■	RTN
2	N.C
3	5.3V
4	N.C
5	Va

⑤ CN810(Main SMPS) ↔ CN2013(Logic B'D)	
Pin No	Signal
1 ■	5.3V
2	5.3V
3	RTN
4	RTN
5	5.3V
6	RTN
7	PS-ON
8	N.C
9	VS-ON
10	STB 5V

⑥ CN1(DC-DC SMPS) ↔ CN2501(TOP E-Buf)	
Pin No	Signal
1 ■	RTN
2	N.C
3	5.3V
4	N.C
5	Va

8-1-2 Main Board ↔ SMPS, SIDE-AV, Power Button, Function Board, Speaker Out Wiring



① CN1002(MAIN B'D) ↔ CN804-1(MAIN SMPS)	
Pin No	Signal
1 ■	FAN-D
2	FAN-ON
3	STB5V
4	RTN
5	PS-ON
6	12V
7	RTN
8	RTN
9	VCA
10	VCS
11	RTN
12	5.3V

② CN1001(MAIN B'D) ↔ CN803(MAIN SMPS)	
Pin No	Signal
1 ■	RTN
2	VT(33V)
3	RTN_AMP
4	RTN_AMP
5	18V_AMP
6	18V_AMP
7	RTN
8	12V
9	RTN
10	6V

③ JA9001(MAIN B'D) ↔ CN2020(LOGIC B'D)

Pin No	Signal	Pin No	Signal	Pin No	Signal
1 ■		12	TXOUT3+	23	TXOUT1B-
2	GND	13	TXOUT3-	24	TXOUT1+
3	PW_SDA0	14	TXCLKOUTB+	25	TXOUT1-
4	GND	15	TXCLKOUTB-	26	GND
5	PW_SCL0	16	TXCLKOUT+	27	GND
6	GND	17	TXCLKOUT-	28	TXOUT0+
7		18	GND	29	TXOUT0-
8	TXOUT0B+	19	GND	30	GND
9	TXOUT0B-	20	TXCLKOUT2+	31	GND
10	I2C_READY	21	TXCLKOUT-	32	GND
11	GND	22	TXOUT1B+	33	GND

④ CN1004(MAIN B'D) ↔ FUNCTION	
Pin No	Signal
1 ■	KEY1
2	KEY2
3	GND

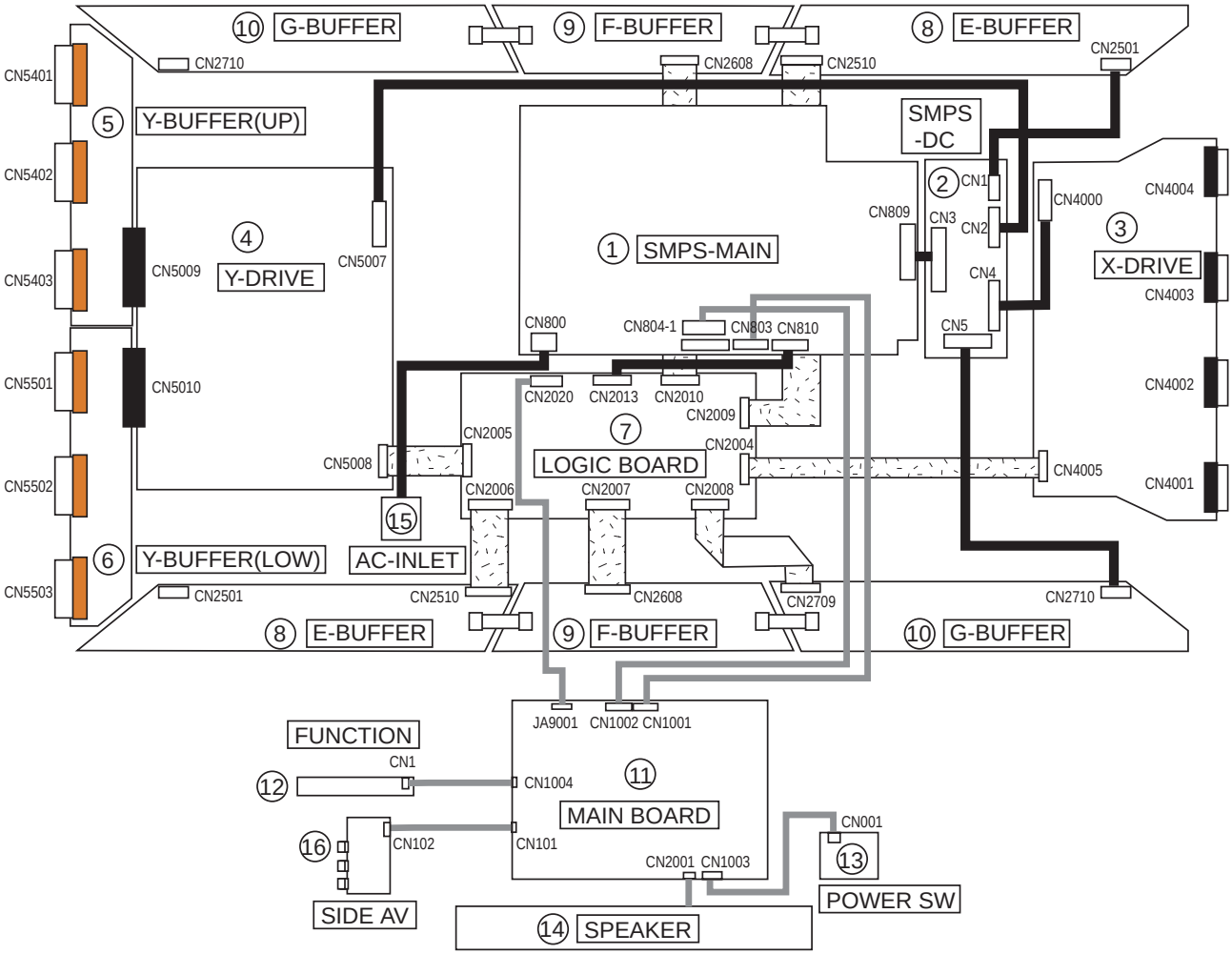
⑤ CN2001(MAIN B'D) ↔ SPEAKER	
Pin No	Signal
1 ■	SPK_R+
2	SPK_R-
3	SPK_L+
4	SPK_L-

⑥ CN1003(MAIN B'D) ↔ POWER BUTTON	
Pin No	Signal
1 ■	GND
2	LED_RED
3	5V
4	GND
5	-
6	SDA
7	SCL
8	IR

⑦ CN101(MAIN B'D) ↔ SIDE-AV	
Pin No	Signal
1 ■	VIDEO2_CVBS
2	GND
3	VIDEO2_IDENT
4	SVHS2_IDENT
5	VIDEO2_SL_IN
6	GND
7	VIDEO2_SR_IN
8	GND
9	SVHS2_Y
10	GND
11	SVHS2_C
12	GND

9. PCB Diagram

9-1 Overall PCB Diagram



No	Assy	Code No.	Description
-	ASSY PDP MODULE P	BN96-03082A	M1,PL50HW005B,V5.0,1366*768,NTSC/PAL,50 inch,with logic
①	ASSY PCB P-SMPS	BN96-01801B	SPD-50P5HDM,100~240V,395*245mm
②	ASSY PCB P-SMPS	BN96-01856A	SPD-50P5HD(DC_DC),200Vin(DC_DC)
③	ASSY PDP P-X MAIN BOARD	BN96-03090A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01045A
④	ASSY PDP P-Y MAIN BOARD	BN96-03091A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01046A
⑤	ASSY PDP P-Y BUFF UPPER BOARD	BN96-03092A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01047A
⑥	ASSY PDP P-Y BUFF LOWER BOARD	BN96-03093A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01048A
⑦	ASSY PDP P-LOGIC BOARD	BN96-03097A	V4 50 HD,B'd with Harness,V4,1366*768,With Harness,Logic Packing
⑧	ASSY PDP P-ADDRESS E BUFF BOARD	BN96-03094A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01103A
⑨	ASSY PDP P-ADDRESS F BUFF BOARD	BN96-03095A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01104A
⑩	ASSY PDP P-ADDRESS G BUFF BOARD	BN96-03096A	M1,PL50HW005A,V5.0,1184 × 700,1366 × 768,NTSC/PAL,50",LJ92-01105A
⑪	ASSY PCB MISC-MAIN	BN94-00860A	HP-R5072CF,D71C,V5
⑫	ASSY BOARD P-FUNCTION	BN96-02549A	SCHUBERT,CT5000-3700,FUNCTION,BLACK KNOB,600mm,SHIELD
⑬	ASSY BOARD P-POWER & IR	BN96-02050E	SCHUBERT,CT5000-3540B,POWER&IR
⑭	ASSY SPEAKER P	BN96-01738B	8ohm,P5,50,15W,Urethan coating
⑮	ASSY MISC P-INLET	BN96-02369A	HP-R4252,STRAUSS,DOCUMENT,INLET.CORE

MEMO

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10. Schematic Diagram

10-1 POWER & TUNER

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Power
Signal

ANALOG POWER

B5V_VCC
+6V
B5V_BA7657
B8V
B9V
+18V_A
B33V
D6V
B3.3V_1
B3.3V_1_1
S_6.5V
S_5V
B3.3V_2
B12V
DIGITAL POWER
A1.8V_CPU
A3.3V
D6V

COMPONENT 1

JA1002 jackSp_2
COMP2_IDENT
COMP2_Y
COMP2_PB
COMP2_PR
JA1004 jackSp_3
COMP2_SL_IN
COMP2_SR_IN

COMPONENT 2

JA1001 jackSp_2
COMP1_IDENT
COMP1_Y
COMP1_PB
COMP1_PR
JA1003 jackSp_3
COMP1_SL_IN
COMP1_SR_IN

POD NIM
TU1001

SEC NIM
TU1002

ALPS NIM
TU1003

TUNER
KOREA : 0x28
USA : 0x14

CONTROL

POD_NIM_OPTION
(USA OPTION)

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10-2 SOUND-PROCESS

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Power
Signal

BD2007,BD2009 : DELETE OPTION

AUDIO DELAY

OPTION
[Delete]
R2009 R2015 R2018 R2030
R2010 R2019 R2031

OPTION
[Delete]
R2047 R2048 R2051 R2052
R2059 R2060 R2061 R2067

SEL_I2S	HIGH	LOW
OUTPUT	EAGLE	HDMI

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10-3 MICOM & IO-EX & AV IN/OUT

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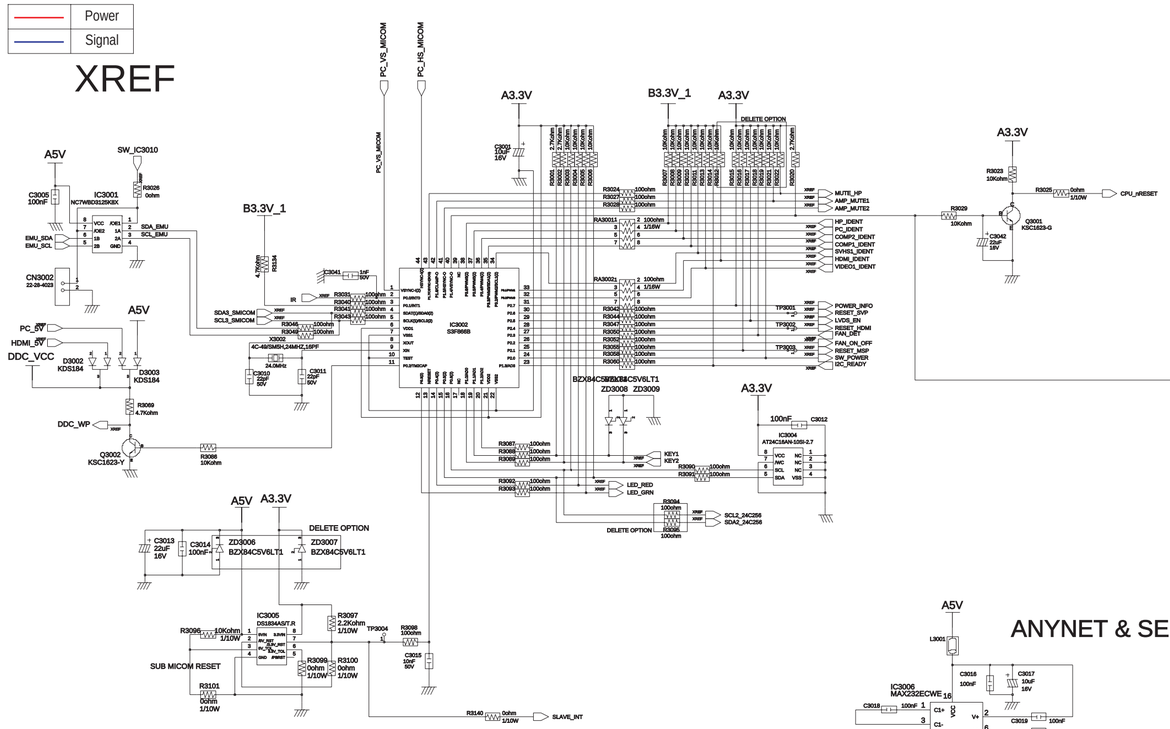
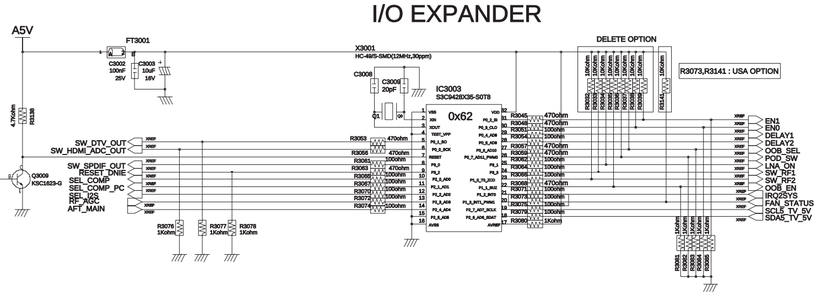
Power
Signal

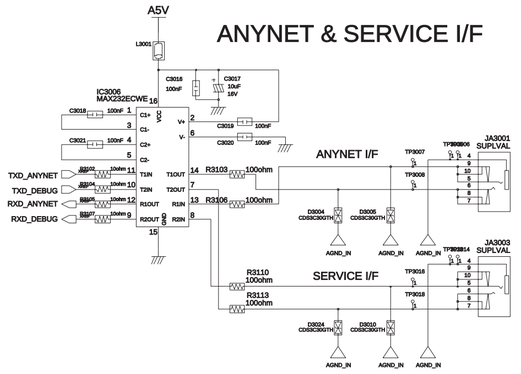
XREF



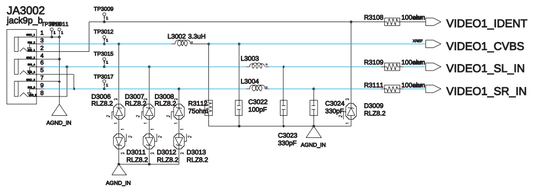
I/O EXPANDER



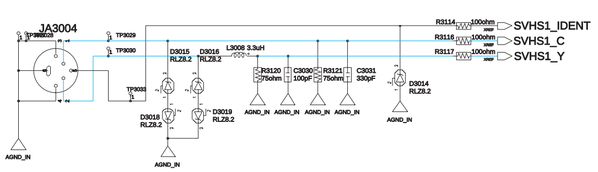
ANYNET & SERVICE I/F



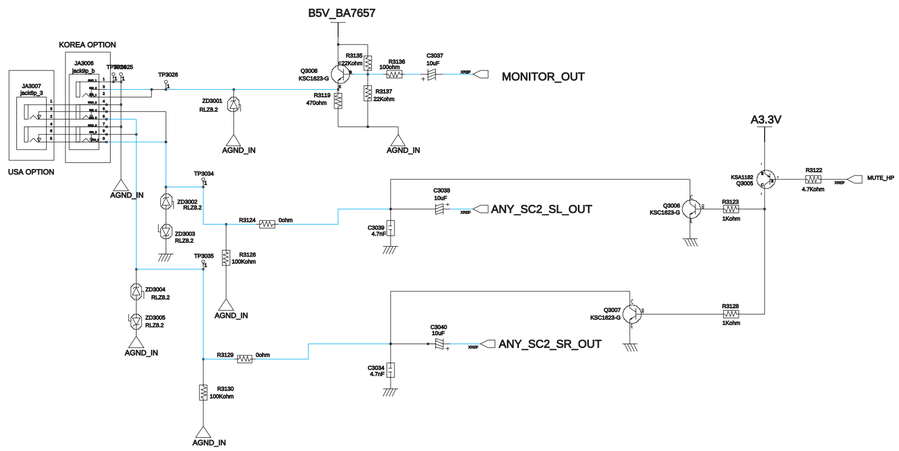
AV INPUT 1



SVHS INPUT 1

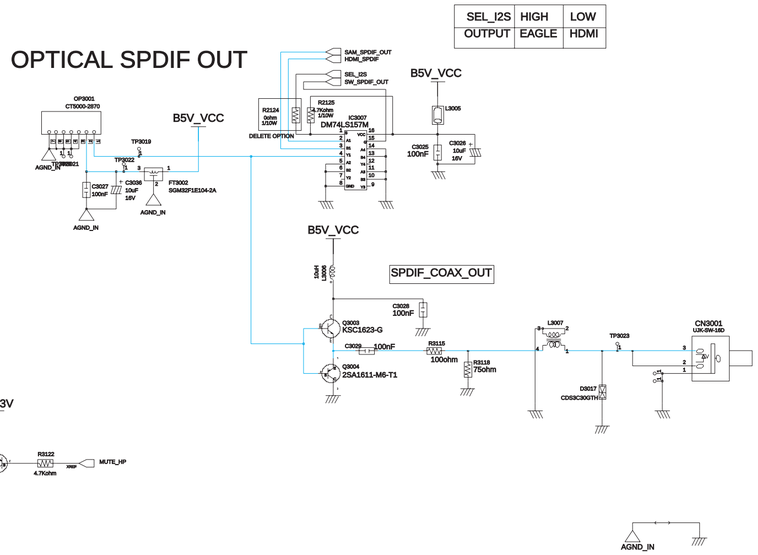


MONITOR_OUT



OPTICAL SPDIF OUT

SEL_I2S	HIGH	LOW
OUTPUT	EAGLE	HDMI



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10-4 HDMI & PC

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Power
Signal

PC_IN

A5V
JA4001
105-15202N230
D4003 D4002 D4003
AGND_IN
PC_RED
PC_GREEN
PC_BLUE
R4006 R4007 R4008
75ohm 75ohm 75ohm
ACB1608H-060-T
BD4002
BD4003
BD4004
R4012 22ohm
R4014 75ohm
R4015 75ohm
R4016 1000ohm
R4017 22ohm
D4007 RLZ8.2
D4004 D4005 D4006
RLZ8.2 RLZ8.2 RLZ8.2
C4032 100pF
C4033 100pF
D4008 RLZ8.2
DDC_VCC
C4028 10uF
C4029 100nF
R4004 10Kohm
R4005 10Kohm
DDC_WP
IC4001
AT24C02N-10SC
R4011 470ohm
R4013 470ohm
A3.3V
PC_5V
PC_IDENT
IC4002
74LCX14MX
C4030 100nF
R4021 100ohm
R4022 100ohm
R4023 100ohm
R4028 100ohm
PC_HS_7657
PC_VS_7657
PC_HS_MICOM
PC_VS_MICOM
C4037 33pF 50V
C4038 33pF 50V
EMU_SDA
EMU_SCL

PC_S_IN

JA4002
SUR-VAL
3722-001061
L4003 10uH
L4004 10uH
R4031 470ohm
R4032 470ohm
PC_SR_IN
PC_SL_IN
D4009 RLZ8.2
D4010 RLZ8.2
D4011 RLZ8.2
D4012 RLZ8.2
C4040 330pF
C4041 330pF

DVI_S_IN

JA4003
jackdp_3
L4005 10uH
L4006 10uH
R4038 470ohm
R4043 470ohm
DVI_SL_IN
DVI_SR_IN
D4013 D4014
D4015 D4016
RLZ8.2
C4042 330pF
C4043 330pF

HDMI_INPUT

DDC_VCC
HDMI_5V
D4018 RLZ5.2B
C4055 10uF 16V
C4056 100nF
R4061 10Kohm
R4062 10Kohm
DDC_WP
IC4004
AT24C02N-10SC
R4065 47ohm
R4066 47ohm
JA4004
DC1R019WDA
P/N:3701-001298
R4071 100ohm
NC
CEC
R4075 0ohm
R4072 0ohm
R4073 330ohm
R4074 330ohm
HDMI_IDENT
D2_DDC_SDA
D2_DDC_SCL
FT4001
FT4002
FT4003
FT4004
D2_RXCLK-
D2_RXCLK+
D2_RX0-
D2_RX0+
D2_RX1-
D2_RX1+
D2_RX2-
D2_RX2+
3301-001594 => 2901-001302
D4024 D4025 D4026 D4027 D4028 D4029 D4030 D4031
MMBD4148SE
A3.3V
D4032 RLZ5.6B-TE-11
D4033 RLZ5.6B-TE-11

B3.3V_1
L4002
C4010 100nF
C4011 100uF
C4012 100nF
C4013 100nF
C4014 100nF
C4015 100nF
C4016 100nF
C4017 100nF
C4018 220pF
C4019 220pF
C4020 220pF

B3.3V_1
L4001
C4001 100nF
C4002 100uF
C4003 100nF
C4004 100nF
C4005 100nF
C4006 100nF
C4007 100nF
C4008 220pF
C4009 220pF

B3.3V_1
BID4001
MPZ2012S300A
R4001 2.7ohm
C4021 82nF
C4027 8.2nF
C4022 10nF 50V
C4023 220pF 50V
C4024 100nF
C4025 220pF

PC_HS_7657
PC_VS_7657
R4003 100ohm
R4009 100ohm
R4010 0ohm
C4079 39pF
DELETE OPTION
C4029 100nF

PC_BLUE
PC_GREEN
PC_RED
SCL4_TV_3.3V
SDA4_TV_3.3V
R4018 100ohm
R4022 100ohm
R4027 100ohm
R4028 100ohm
R4030 100ohm
C4031 47nF
C4034 47nF
C4035 1nF
C4036 47nF
C4039 100nF

IC4003
MST9883CR-110
0x98

SVP_B(0:7)
SVP_G(0:7)
SVP_R(0:7)
R4016 R4025 R4026
22 ohm
RA4001 RA4002 RA4003 RA4004 RA4005 RA4006
22 ohm

R4039 1000hm
R4034 22
SVP_R(0:7)

HDMI

B3.3V_1
R4036 4.7Kohm
IRQ2SYS
RESET_HDMI
R4037 0ohm
R4042 100ohm
C4044 100nF 25V
HDMI_VS
HDMI_HS
R4044 22ohm
R4045 22ohm
R4047 22ohm
R4049 22ohm
R4046 0ohm
R4048 0ohm
R4050 0ohm
R4053 0ohm
HDMI_DE
HDMI_AD_VS
HDMI_AD_HS
HDMI_AD_CLK

B3.3V_1
R4051 390ohm
D2_RX2- D2_RX2+
D2_RX1- D2_RX1+
D2_RX0- D2_RX0+
D2_RXCLK+ D2_RXCLK-
R4052 10ohm
R4053 100ohm
R4054 10ohm
R4055 100ohm
R4056 10ohm
R4057 100ohm
R4058 10ohm
R4059 100ohm

IC4005
SII9993CT100
0x60

SVP_B(0:7)
SVP_G(0:7)
SVP_R(0:7)
RA4001 RA4002 RA4003 RA4004 RA4005 RA4006
22 ohm

B3.3V_1
BD4005
BLM41P600S
C4045 100uF 16V
D4017
RLZ5.6B-TE-11
C4047 22uF 16V
C4048 100nF
C4049 100nF
C4050 1nF
BD4006
ACB1608H-060-T
C4051 10uF 16V
C4052 100nF
C4053 1nF
BD4007
BLM41P600S
C4057 22uF 16V
C4058 100nF
C4059 1nF
BD4008
BLM41P600S
C4062 22uF 16V
C4063 100nF
C4064 100nF
C4065 1nF
C4066 1nF
BD4010
ACB1608H-060-T
C4073 10uF 16V
C4074 100nF
C4075 1nF
C4076 10uF
C4077 47nF
R4080 3.9Kohm
R4081 4.7Kohm
R4082 4.7Kohm

DELETE OPTION
R4060 33ohm
R4063 33ohm
R4064 33ohm
C4054 100pF
HDMI_MCLK
HDMI_SCLK
HDMI_LRCLK
HDMI_SDO
HDMI_SPDIF
R4067 0ohm
R4068 0ohm
R4069 0ohm
TP4017
TP4018
TP4019
ANALOG_Y/Pb/Pr

ANALOG
C4061 10nF
C4060 10uF 16V
C4067 1nF
C4068 1nF
C4069 100nF
C4070 100nF
C4071 22uF 16V
C4072 100nF
BD4009
ACB1608H-060-T
D4022
RLZ5.6B-TE-11
R4076 100ohm
NC

B3.3V_1
A5V
R4077 4.7Kohm
R4078 4.7Kohm
C4078 26V 1000pF
IC4006
NC7WBD3125K8X
D2_DDC_SCL
D2_DDC_SDA
R4079 47ohm
R4083 47ohm
R4084 100ohm
R4085 100ohm
SCL4_TV_3.3V
SDA4_TV_3.3V

AGND_IN
DGND_IN

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10-5 SVP-EX52

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Power	
Signal	

IC5004

STP22 (SVP-EX62)

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10-6 S3C2800

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IC6006
S3C2800X

EEPROM WRITE JIG Connector
1: DATA
2: CLOCK
3: BUS_STOP (LOW ACTIVE)
4: WRITE PROTECTION
5: GROUND
6: 5V

OPTION
KOREA : 1107-001228(8M)
USA : 1107-001229(16M)

TP_POINT_CHECK
PITCH:2.54mm

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10-7 EAGLE+

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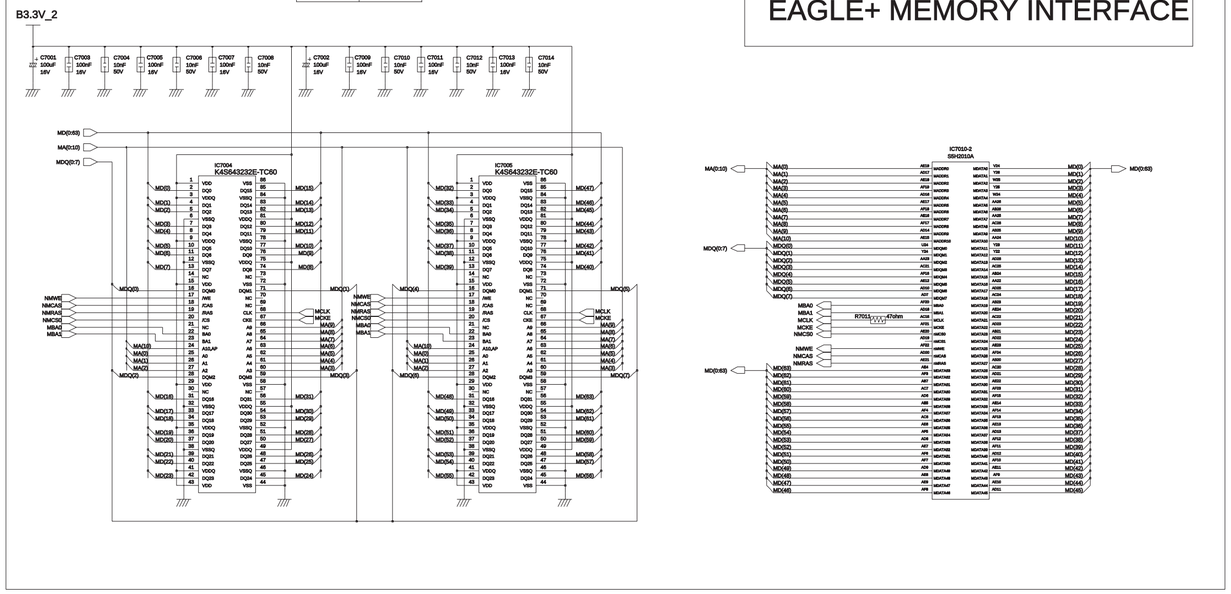
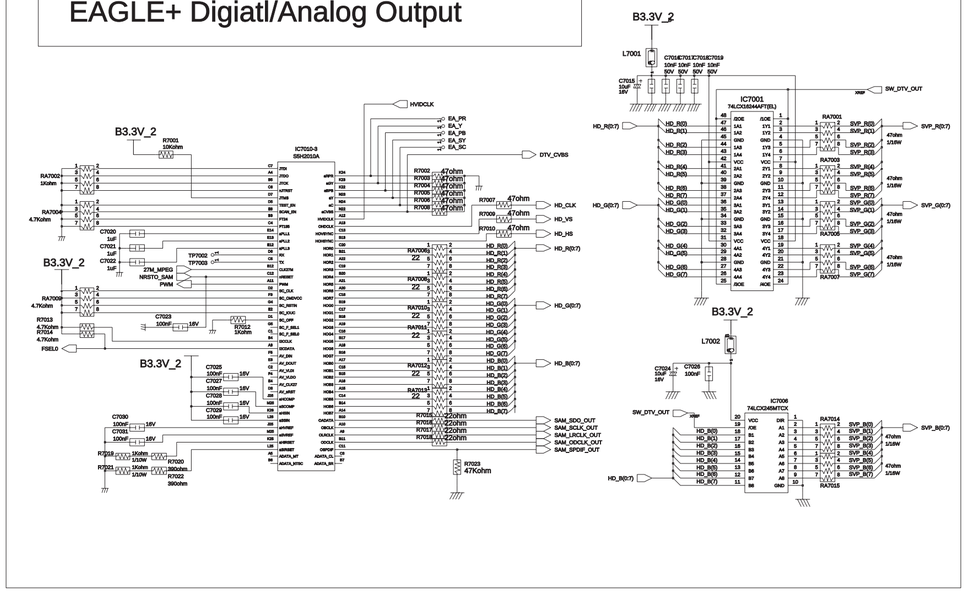
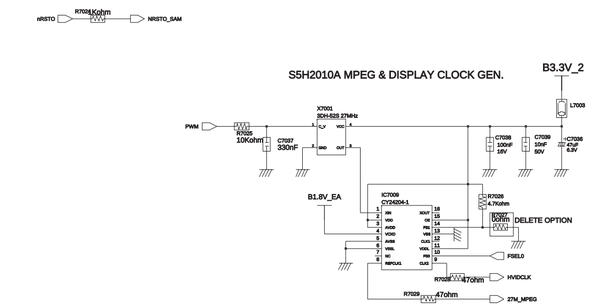
Power
Signal

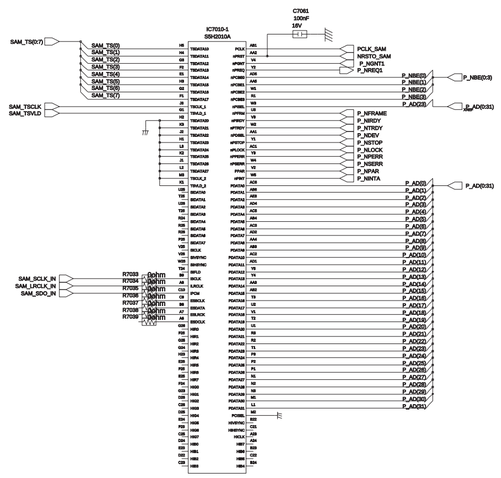
EAGLE+ MEMORY INTERFACE

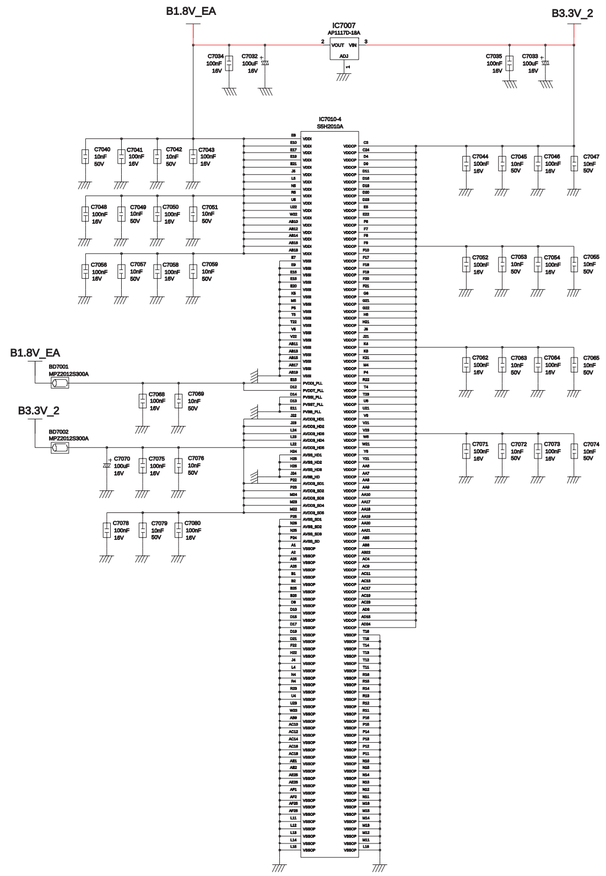


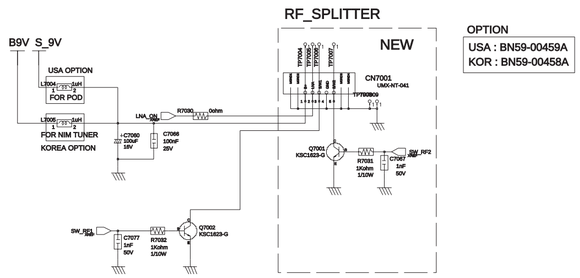
EAGLE+ Digiatl/Analog Output











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10-8 POD * This page is not reguired for PODless model.

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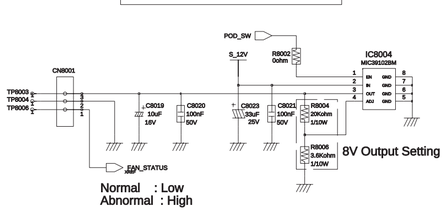
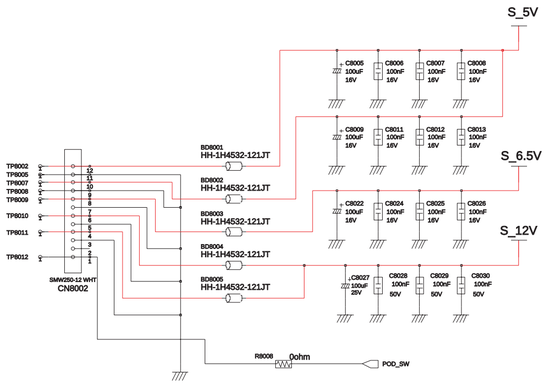
Power
Signal

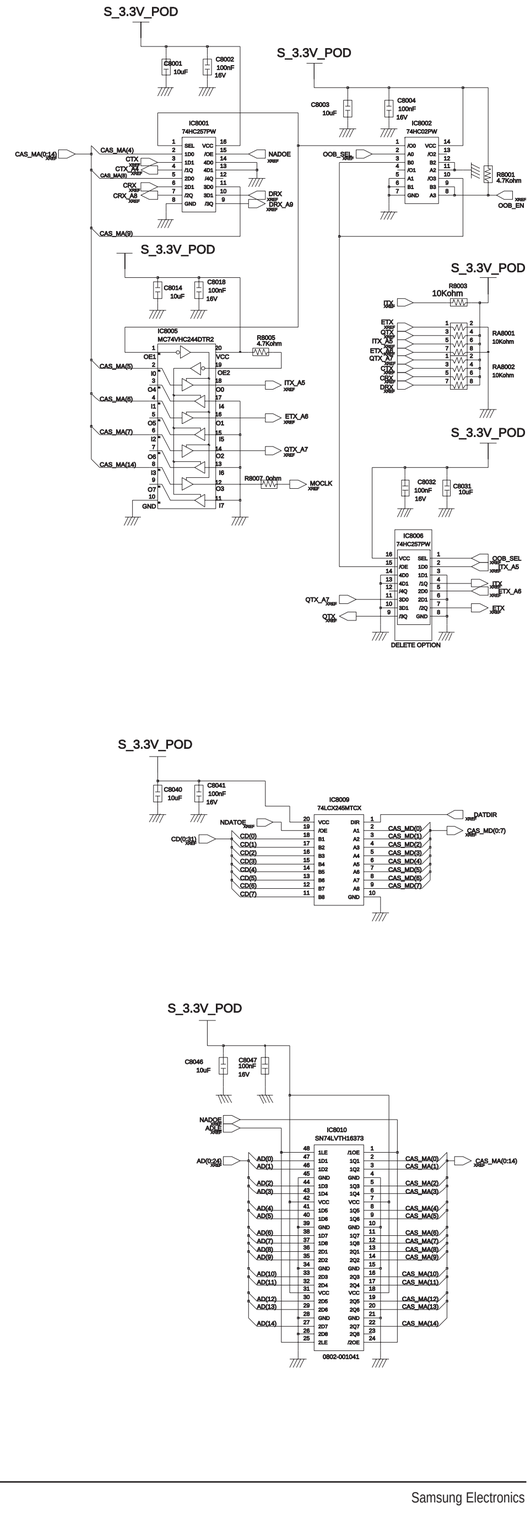
USA ONLY

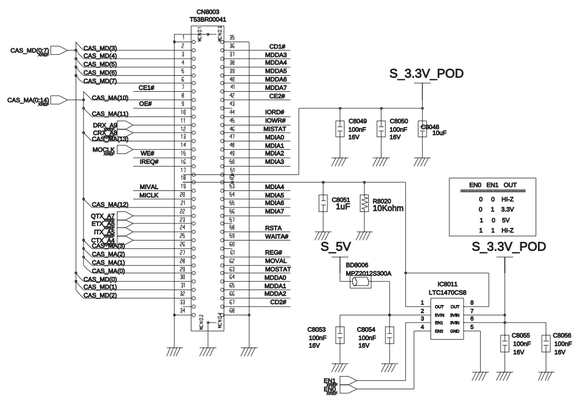
PCMCIA FAN CONNECTOR



POWER INPUT FOR POD STAND-BY







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10-9 DNIe Lite & LVDS

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Power
Signal

RESET_DNIE
SCL4_TV_3.3V
SDA4_TV_3.3V
B3.3V_DN
B3.3V_DLVTX
B3.3V_DLVRX
DELETE OPTION
DNIE_RIN(0:9)
DNIE_BOUT(0:11)
DNIE_VSOUT
DNIE_HSOUT
DNIE_CLKOUT
N.C
DNIE_TXOUT0-
DNIE_TXOUT0+
DNIE_TXOUT1-
DNIE_TXOUT1+
DNIE_TXOUT2-
DNIE_TXOUT2+
DNIE_TXCLKOUT-
DNIE_TXCLKOUT+
DNIE_TXOUT3-
DNIE_TXOUT3+
SOUND_SEL1
close to pin 102
close to pin 29
DNIE_GIN(0:9)
DNIE_BIN(0:9)
DNIE_GOUT(0:11)
DNIE_ROUT(0:11)

IC9002
DNIE-LCD
DNIe_LITE
0xC8

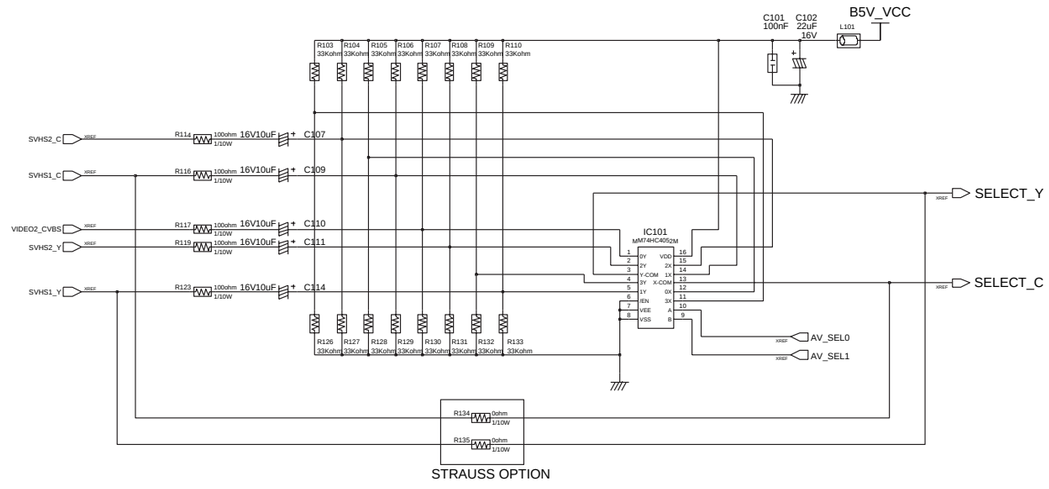
B3.3V_1
DNIE_ROUT(0:11)
DNIE_GOUT(0:11)
DNIE_BOUT(0:11)
IC9003
DTC34LM85A
128T_Tx_0-
128T_Tx_0+
128T_Tx_1-
128T_Tx_1+
128T_Tx_2-
128T_Tx_2+
128T_Tx_CLK-
128T_Tx_CLK+
128T_Tx_3-
128T_Tx_3+
R9037 100ohmsaw
LVDS_EN
DNIE_HSOUT R9035 22ohm
DNIE_VSOUT R9036 22ohm
DNIE_DEOUT R9037 22ohm
DNIE_CLKOUT R9039 22ohm
DELETE OPTION

FROM DNIe Lite (12BIT)
A5V
R9024 1Kohm
SCL4_TV_3.3V
SDA4_TV_3.3V
R9027 100ohm
R9029 100ohm
R9030 100ohm
DELETE OPTION

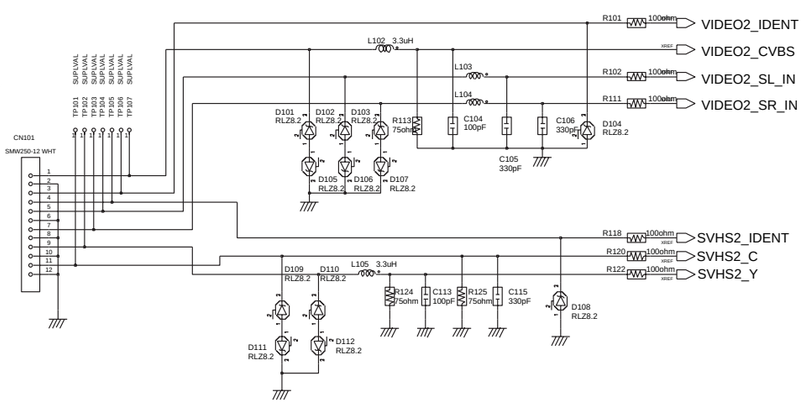
B3.3V_1
B3.3V_DLVRX
B3.3V_DLVTX
B3.3V_DN
B1.8V_DN
IC9005
AP1117D-18A
IC9004
DS90C387VJD

10-10 Side-AV

This Document can not be used without Samsung's authorization.

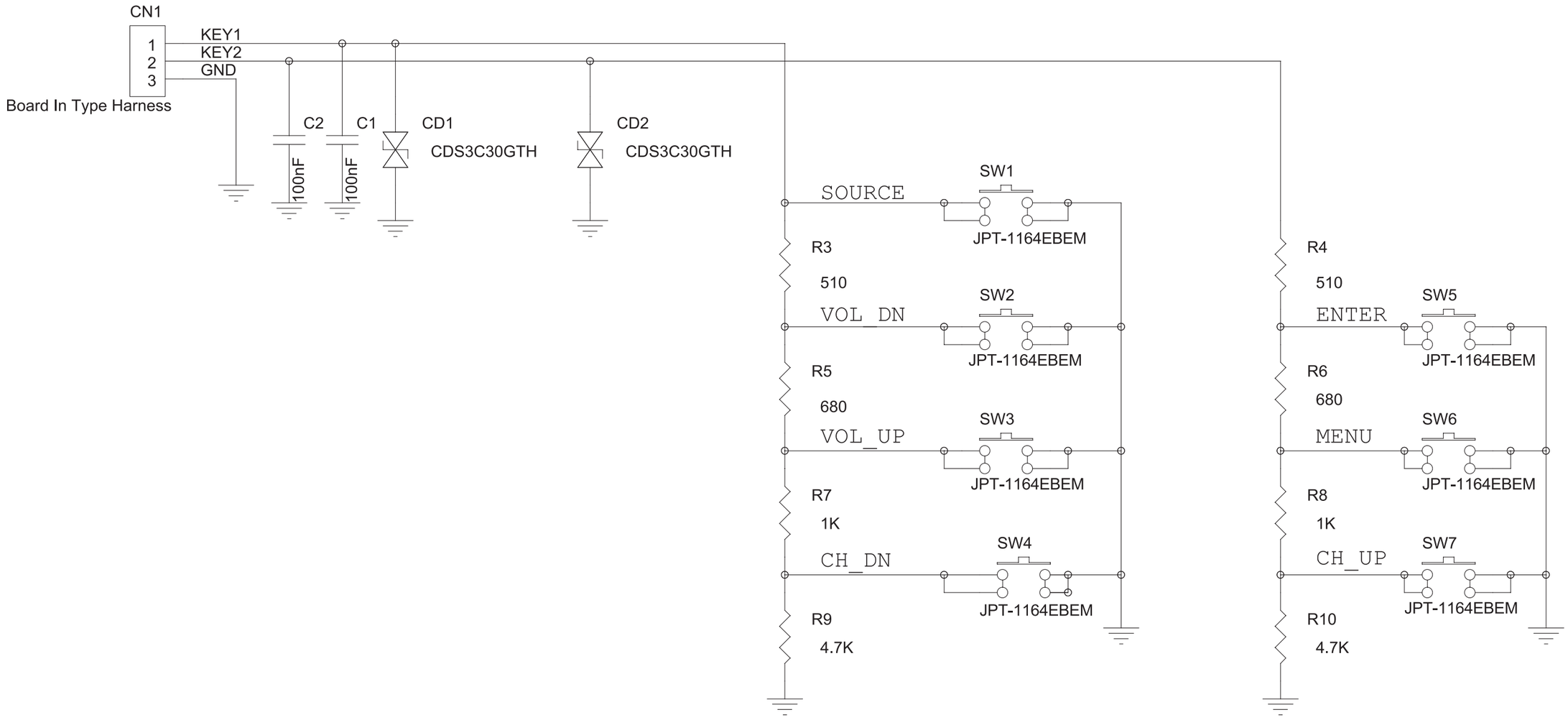


SIDE AV ASSY



10-11 Function A'ssy Board

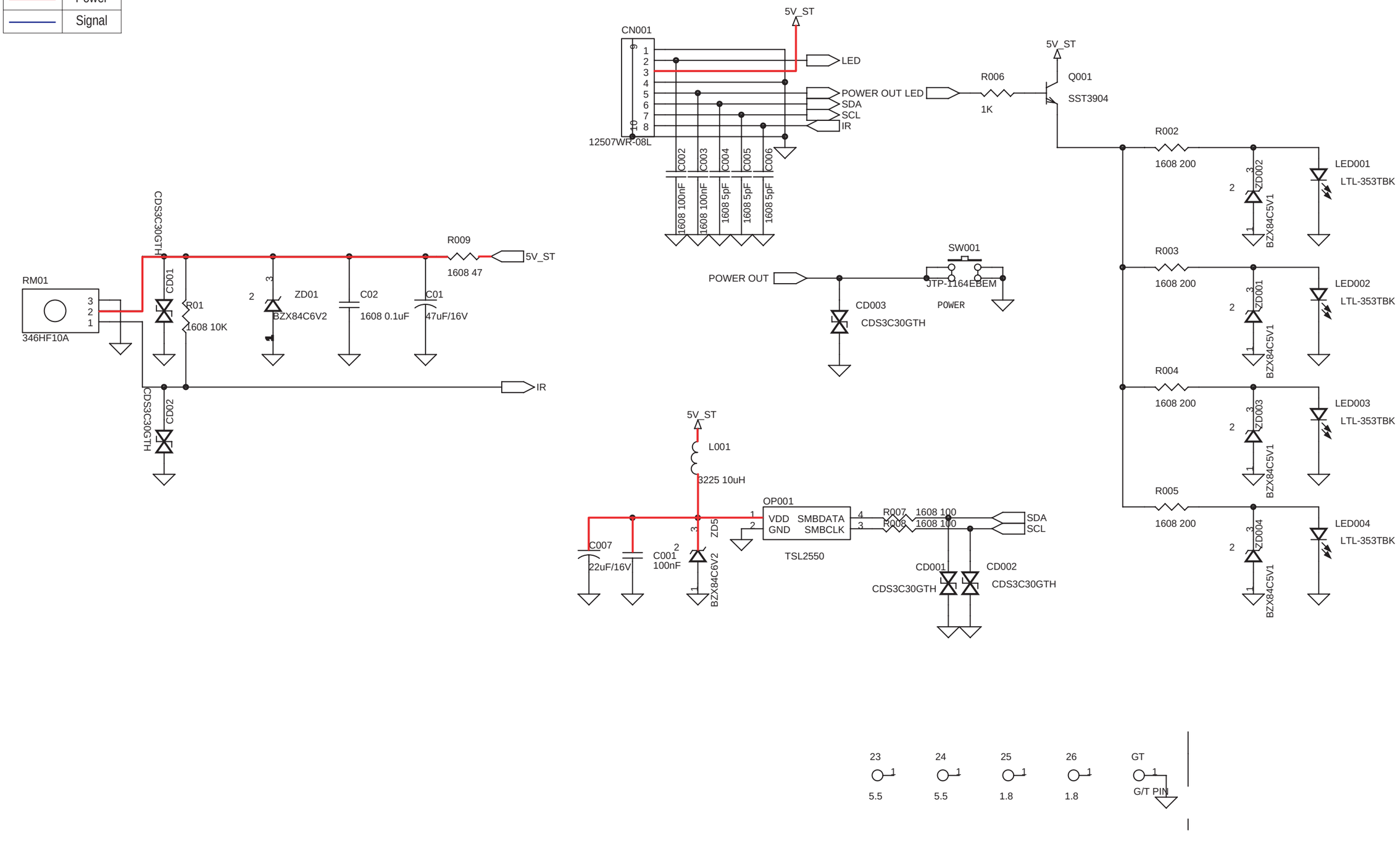
This Document can not be used without Samsung's authorization.



10-12 Power & IR A'ssy Board

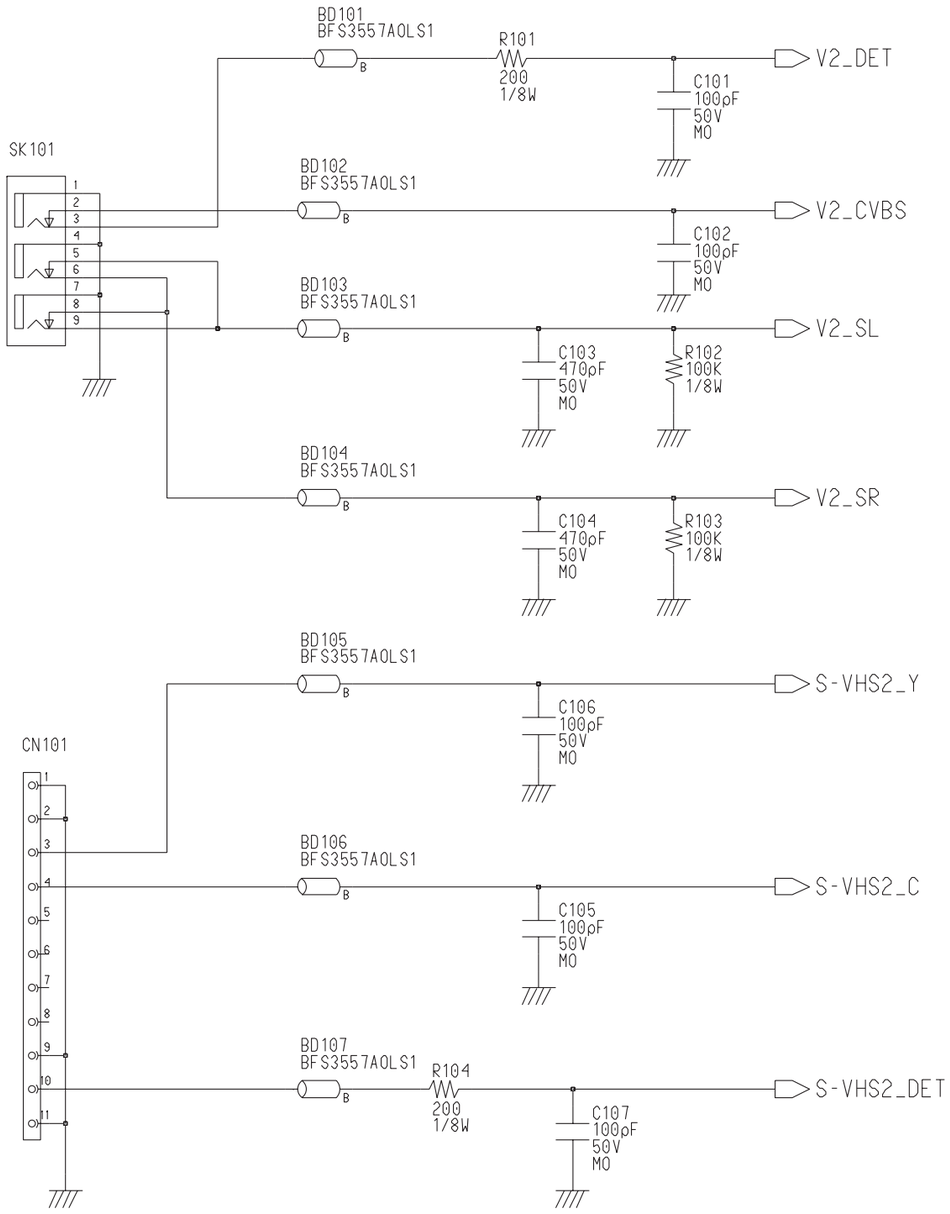
This Document can not be used without Samsung's authorization.

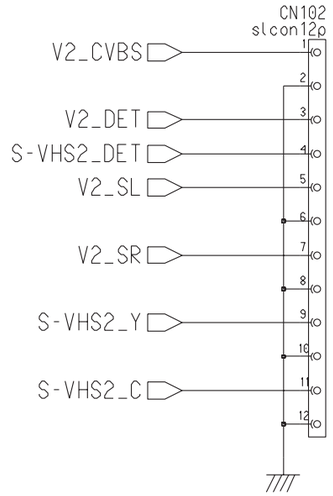
	Power
	Signal



10-13 Assy Side-AV

This Document can not be used without Samsung's authorization.

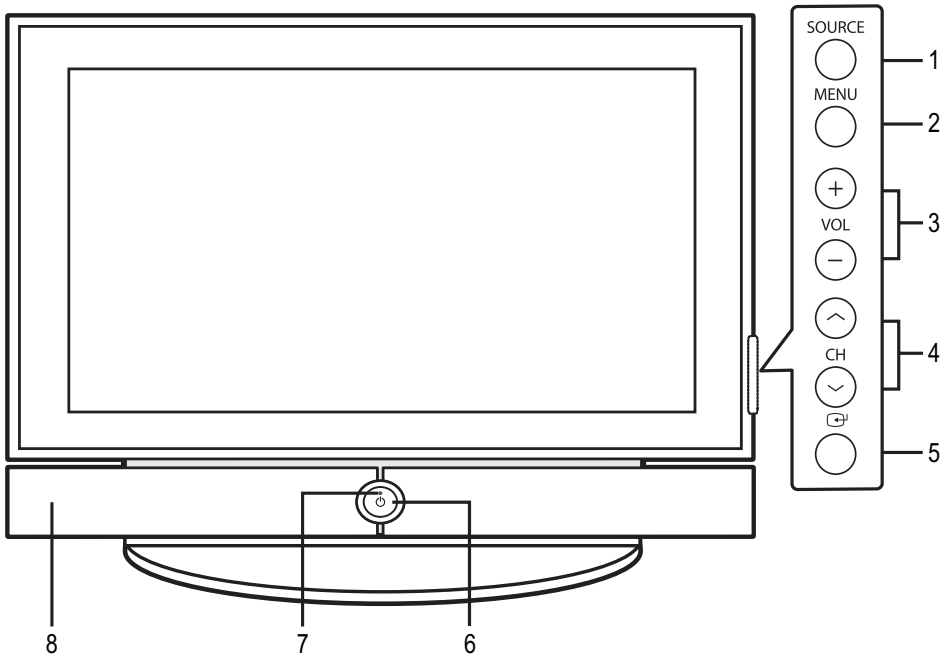




11. Operation Instruction & Installation

11-1 Product Features and Functions

11-1-1 Front Panel



1 SOURCE button
Press to display all of the available video sources (TV, AV1, AV2, S-Video1, S-Video2, Component1, Component2, PC, and HDMI).

2 MENU button
Displays the main on-screen menu.

3 VOL +, - buttons
Press to increase or decrease the volume. Also used to select or adjust items on the on-screen menu.

4 CH(∧ ,∨) buttons
Press CH ∧ or CH ∨ to change channels. Also used to move up or down in the on-screen menu.

5 (Enter) button
Press to confirm a selection.

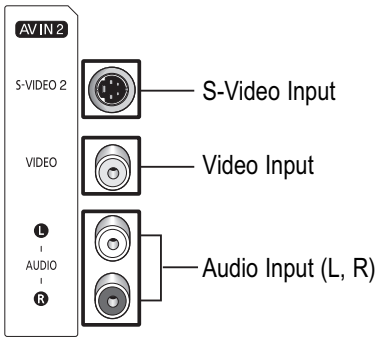
6 Power button
Press to turn the TV on and off.

Power indicator
- Power Off : Blue
- Power On : Off

7 Remote Control Sensor
Aim the remote control towards this spot on the TV.

8 Speakers

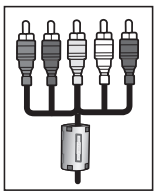
11-1-2 Side of the TV



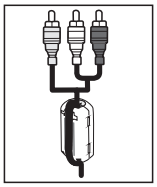
Ferrite Cores

The ferrite cores are used to attenuate undesired signals.
When connecting cables, attach one of these ferrite cores to the cable near the connector.
When you connect COMPONENT (VIDEO, AUDIO), or Side AV(VIDEO, AUDIO) first bind the ferrite core around each cable to secure it.

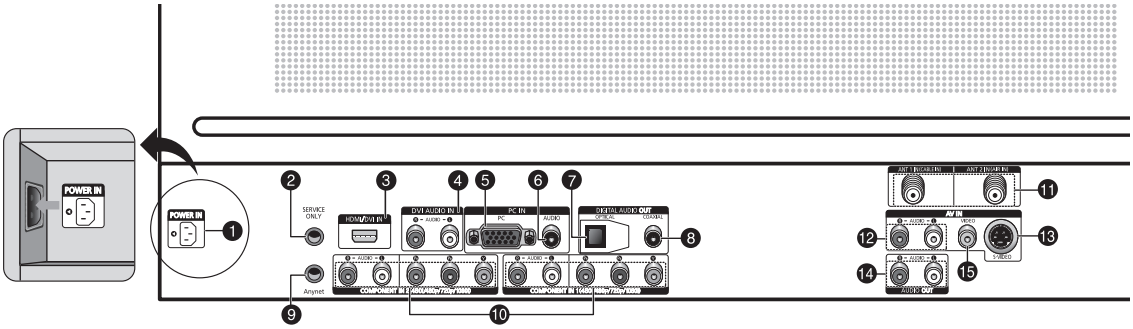
COMPONENT



Side AV



11-1-3 Rear Panel



1 POWER IN
Connect the supplied power cord.

2 SERVICE ONLY
Connector for service only.

3 HDMI/DVI IN
Connect to the HDMI jack of a device with HDMI output.
These inputs can also be used as a DVI connection with separate analog audio inputs. An optional HDMI/DVI cable will be necessary to make this connection.
When using the optional HDMI/DVI adapter, the DVI analog audio inputs on your TV allow you to receive left and right audio from your DVI device. (Not compatible with PC)

4 DVI AUDIO IN (AUDIO-L/R)
Connect to the DVI audio output jack of an external device.

5 PC IN
Connect to the video output jack on your PC.

6 PC AUDIO IN
Connect to the audio output jack on your PC.

7 OPTICAL DIGITAL AUDIO OUT
Connect to a Digital Audio component.

8 COAXIAL DIGITAL AUDIO OUT
Connect to a Digital Audio component.

9 Anynet
Please refer to the Anynet Owner's Instruction. This jack is for connecting to other Samsung Anynet-enabled devices.

10 COMPONENT IN 1, 2
Video (Y/P_B/P_R) and audio (L-AUDIO-R) component inputs.

11 ANT (75Ω)
75 Ω Coaxial connector for Antenna/Cable Network.

12 AV IN (AUDIO-L/R)
Audio inputs for external devices, such as a camcorder or VCR.

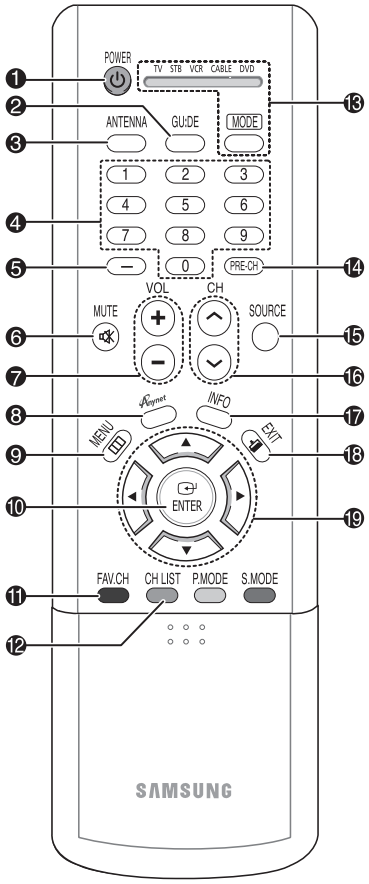
13 S-VIDEO
Video input for external devices with an S-Video output, such as a camcorder or VCR.

14 AUDIO OUT
Audio outputs for external devices.

15 VIDEO
Video input for external devices, such as a camcorder or VCR.

Note
- Please be sure to match the color coded input terminals and cable jacks.

11-1-4 Remote Control



1 POWER button
Turns the TV on and off.

2 GUIDE button
Press to display the on-screen Electronic Program Guide (EPG).

3 ANTENNA button
Press to select “Air” or “Cable”.

4 Number buttons

5 – button
Press to select additional channels (digital and analog) being broadcast by the same station. For example, to select channel “54-3”, press “54”, then press “ – ” and “3”.

6 MUTE button
Press to mute the TV sound.

7 VOL (Volume) buttons
Use it to adjust volume.

8 Anynet button
Runs the Anynet view functions and sets up Anynet devices.

9 MENU button
Displays the main on-screen menu.

10 ENTER button
Confirms a selection.

11 FAV.CH button
Press to switch to your favorite channels.

12 CH LIST button
Displays the channel list.

13 MODE button
Selects a target device to be controlled by the Samsung remote control (i.e., TV, STB, VCR, CABLE, or DVD).

14 PRE-CH button
Tunes to the previous channel.

15 SOURCE button
Press to display all of the available video sources (TV, AV, S-Video, Component1, Component2, PC, and HDMI).

16 CH (Channel) buttons
Use it to switch channels.

17 INFO button
Press to display information on the TV screen.

18 EXIT button
Press to exit the menu.

19 Up/Down/Left/Right buttons
Control the cursor in the menu.

20 P.MODE button
Adjust the TV picture by selecting one of the preset factory settings (or select your personal, customized picture settings).

21 S.MODE button
Select Sound effect.

22 E.SAVING button
Press to adjust screen brightness according to surrounding environment. (Refer to page 111)

23 P.SIZE button
Select Picture size.

24 DNIe button
Activates DNIe (Digital Natural Image engine).

25 MTS button
Press to choose stereo, mono or Separate Audio Program (SAP broadcast).

26 SET button
Used during set up of this Samsung remote control, so that it will work compatibly with other devices (VCR, Cable Box and DVD).

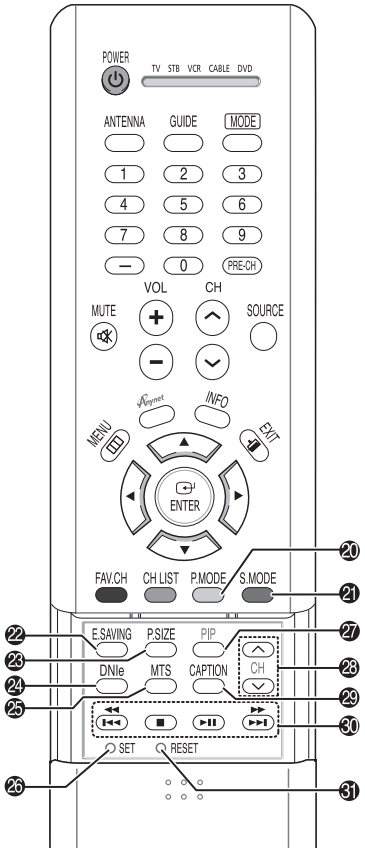
27 PIP button
Activates picture in picture.

28 PIP control buttons
CH (▲), (▼): Displays the available channels in sequence. (These buttons change channels in the PIP window only.)

29 CAPTION button
Controls the caption decoder.

30 VCR, DVD control buttons
Controls VCR tape or DVD disc functions: Stop, Rewind, Play/Pause, and Fast Forward.

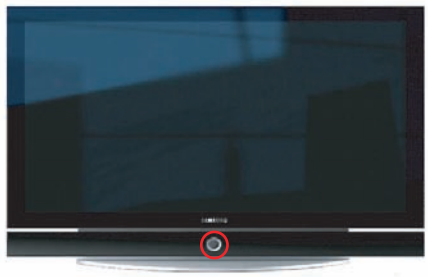
31 RESET button
If your remote control is not functioning properly, take out the batteries and press the reset button for about 2~3 seconds.
Re-insert the batteries and try using the remote control again.



11-2 New Features

11-2-1 Energy Saving Mode (Applies to the "Setup" of the User Menu)

- Location of the Ambient Light Sensor



The sensor is attached to the Power Assy., which is on the front of the PDP. The location of the sensor on the Power Assy is displayed in the figure below. External light reaches the sensor through the guide of the Power Assy.

The screen brightness is adjusted according to the brightness measured by the Ambient Light Sensor, using the Multi APC function (controls the number of sustain pulses according to the average signal levels) of the PDP panel, thus reducing power consumption.

- Procedures for entering the menu: Select Menu → Setup → Energy Saving Mode

When pressing the "Energy Saving Mode" button on the remote control:
The Energy saving mode changes in the sequence of "Standard" → "Auto Saving" → "Super Saving".

- Description of each power saving mode
Standard: The screen brightness and the power consumption are not changed regardless of the ambient brightness measured by the Ambient Light Sensor.
Auto Saving: The screen brightness and the power consumption are changed depending on the ambient brightness. If the ambient brightness is low, it automatically turns the TV brightness down and reduces the power consumption.
Super Saving: This mode controls the screen brightness so that the power consumption is always reduced regardless of the ambient brightness.

.

11-2-2 PIP Settings (A : Analog, D : Digital, X : PIP doesn't operate, ○: PIP and swap operate)

PIP screen \ Main screen		TV		AV(A)	S-Video(A)	Component(A)	PC	HDMI(D)
		Analog	Digital (ATSC)					
TV	Analog	X		X	X	X	○	○
	Digital (ATSC)			○	○	○	X	X
AV(A)		X	○	X	X	X	○	○
S-Video(A)		X	○	X	X	X	○	○
Component(A)		X	○	X	X	X	○	○
PC		X	X	X	X	X	X	X
HDMI(D)		○	X	○	○	○	X	X

Note : This TV has only one tuner and does not allow you to watch one TV channel in the main screen and another channel in the PIP screen.

11-3 Installation Notes and Precautions

11-3-1 Installation Notes

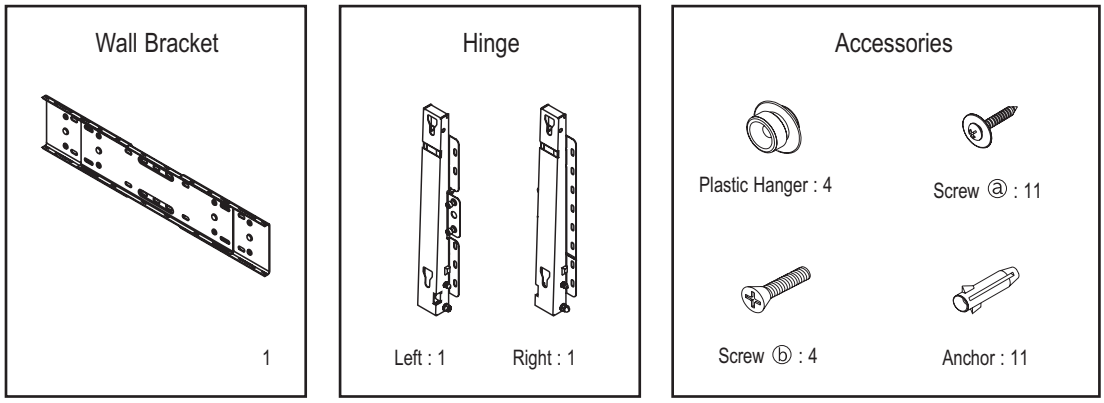
1. Contact a technician for installing the wall bracket.

2. Samsung Electronics is not responsible for any damage to the product or injury to yourself or others if you elect to perform the wall installation.

3. This product is for installing on cement walls. The product may not stay in place when installed on plaster or wood.

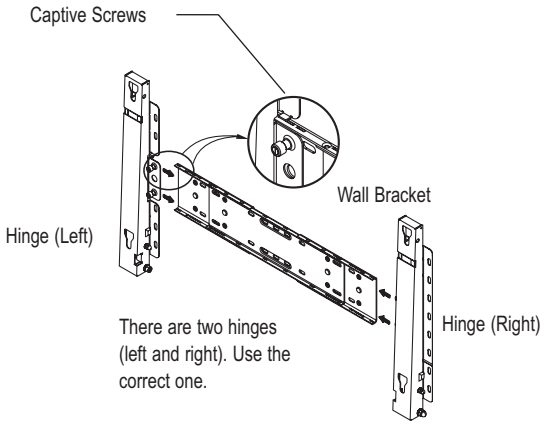
11-3-2 Parts (Wall attachment panel is sold separately)

Only use the components and accessories shipped with the panel.

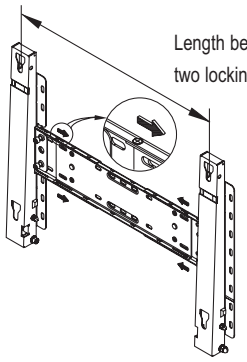


11-3-3 How to assemble the Wall Mount Bracket

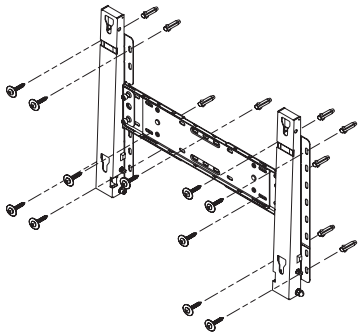
1 Insert and tighten the Captive Screw in the direction of the arrow.
When done, mount the wall bracket on the wall.



2 Before drilling into the wall, check if the length between the two locking holes at the back of the product is correct.
If the length is too short or long, loosen all or some of the 4 screws on the wall bracket to adjust the length.

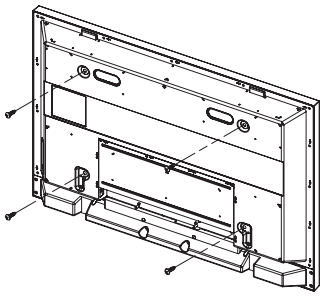


3 Check the installation diagram and mark the drill points on the wall.
Use the 5.0 mm bit to drill holes deeper than 35 mm. Fix each anchor in the corresponding hole.
Match each of the brackets and hinge holes to the corresponding anchor holes and insert and tighten the 11 screws ①.

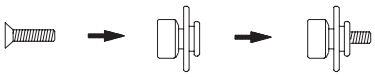


11-3-4 Fixing the TV panel to the wall attachment panel bracket

1 Remove the 4 screws on the back of the product.

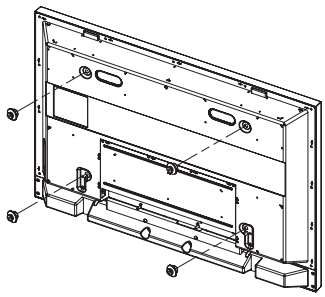


2 Insert the screw ⓑ into the plastic hanger. (See the figure below)

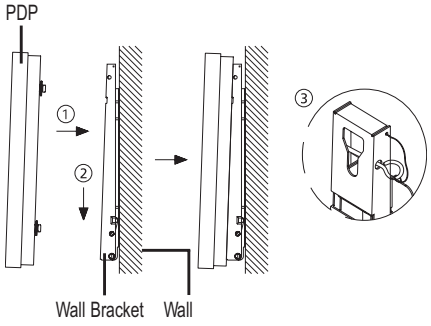


- Mount the product on the wall bracket and make sure it is properly fixed to the left and right plastic hangers.
- Be careful when installing the product on the bracket as fingers can be caught in the holes.
- Make sure the wall bracket is securely fixed to the wall, or the product may not stay in place after installation.

3 Tighten the 4 screws in step 2 (plastic hanger + screw ⓑ) to the rear holes of the product.



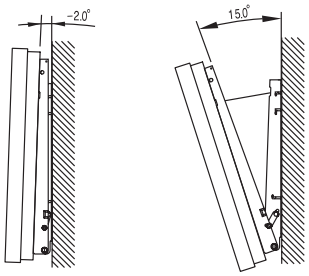
4 Remove safety pin (③) and insert the 4 product holders into the corresponding bracket holes (①). Then place the product (②) so that it is firmly fixed to the bracket. Make sure to reinsert and tighten the safety pin (③) to securely hold the product to the bracket.



11-3-5 How to Adjust Mounting Angle

Note : Adjust the bracket angle to -2° before installing it on the wall.

Change Angle

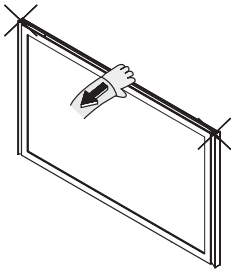


1 Fix the product to the wall bracket.

2 Hold the product at the top in the center and pull it forward (direction of the arrow) to adjust the angle. (See the figure to the right)

3 You can adjust the bracket angle between -2° and 15°.

How to Adjust Mounting Angle



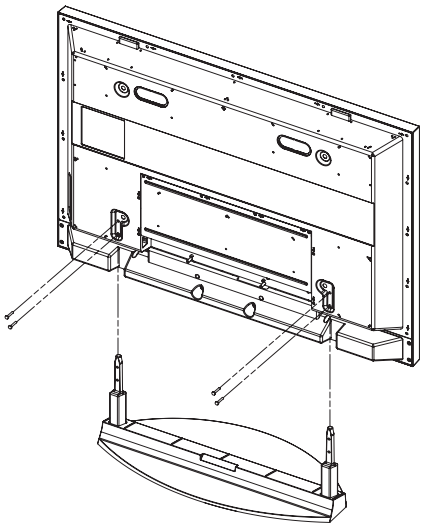
Make sure to use the top center, and not the left or the right side of the product to adjust the angle.

Notes

- Contact an authorized technician when installing the wall attachment panel.
- After hanging the TV panel on the wall attachment panel, make sure that the Insulation holders are completely secured.
- Be careful not to get your fingers caught during installation.
- Make sure the wall attachment panel brackets are tightened. Otherwise, the TV panel may fall down.
- Please secure the mounting bracket on the wall surface after setting its angle at 0°.

11-3-6 How to assemble the Stand-Base

1 Using the 4 screws for securing the stand pegs and the monitor, firmly attach the monitor to the stand pegs. (The exterior of the set may be different than the picture.)



Warning

Firmly secure the stand to the TV before moving it, as the stand may fall and could cause serious injury.

➤ Two or more people should carry the TV. Never lay the TV on the floor because of possible damage to the screen. Always store the TV upright.

12. Disassembly & Reassembly

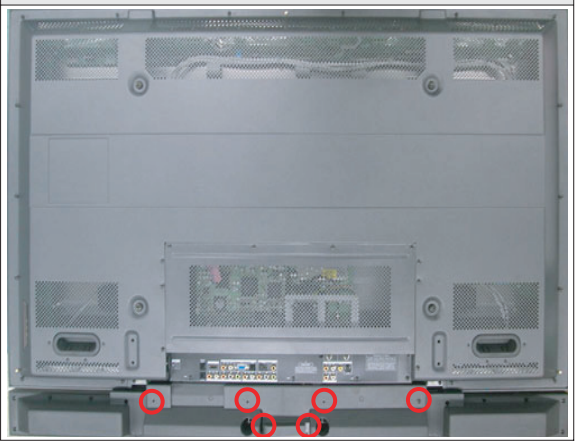
12-1 Overall Disassembly & Reassembly

⚠ Notice
- Be sure to separate the power cord before disassembling the unit.
- Discharge the capacitors first when separating PCB's with high capacity capacitors such as SMPS, X Drive Board, Y Drive Board, etc. (A spark may be generated by the electric charge, and there is danger of electronic shock.)
- Check that the cables are properly connected referring to the circuit diagram when disassembling or assembling the unit taking care not to damage the cables.
- Take care not to cause a flaw in the Glass Filter in the front.
- Assemble the boards in the reverse order of the disassembly.
- The plasma must be layed down on a flat padded surface for disassembly and reassembly.

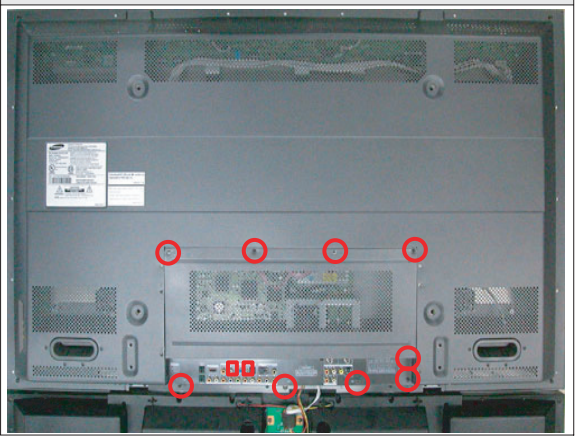
12-1-1 Separation of Stand

Part Name	Description	Description Photo
Stand	① Remove 4 screws. : PH,+,WSP,S,M4,L35,ZPC(BLK) ② Pull the stand down to remove it from the unit. ⚠: Please lay the PDP unit face down on a soft surface when removing the stand.	

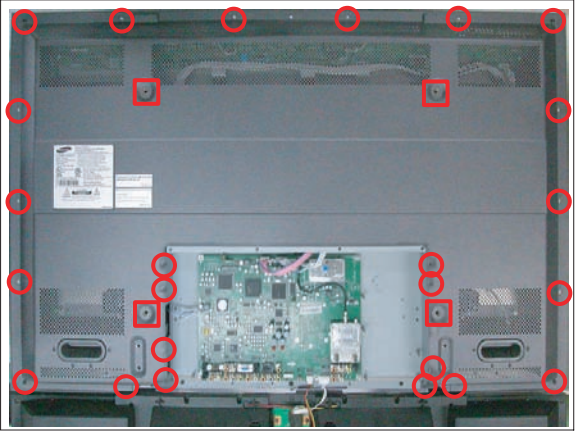
12-1-2 Separation of ASSY COVER-STAND CABLE

Part Name	Description	Description Photo
Cover Stand	① Remove 6 screws on the SPEAKER-COVER : BH,+,B,M4,L12,ZPC(BLK) ② Remove the SPEAKER-COVER.	

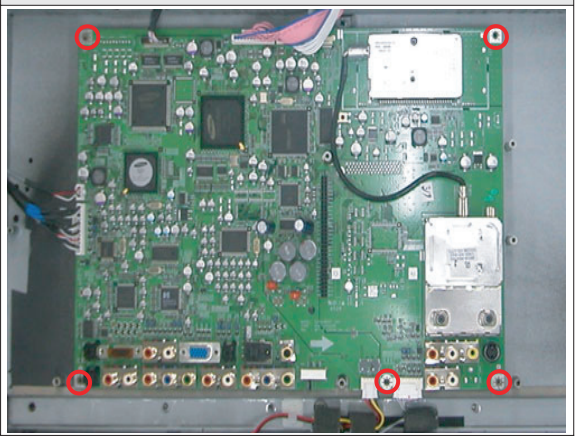
12-1-3 Separation of ASSY COVER P-REAR TOP

Part Name	Description	Description Photo
Rear Top	① Remove the 9 screws on the cover rear. : BH,+,-,S,M4,L8,ZPC(BLK) ② Remove the 2 Hex nuts for the PC input. : M3,L6,NI PLT,SUM24L,#4-40 ③ Remove the cover rear.	

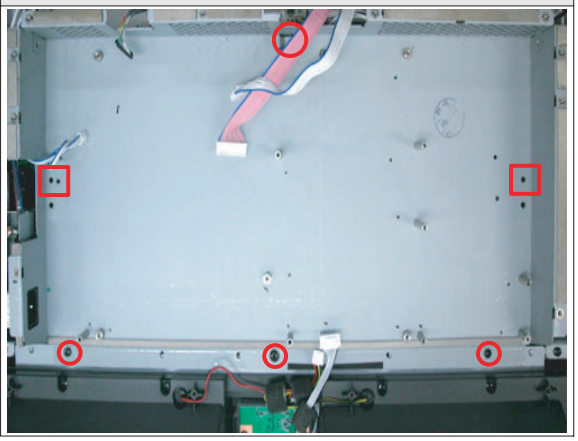
12-1-4 Separation of ASSY COVER P-REAR

Part Name	Description	Description Photo
Rear	① Remove 24 screws. : BH,+,-,S,M4,L8,ZPC(BLK) ② Remove 4 screws. : M8,L16,ZPC(BLK) ③ Remove the Back Cover.	

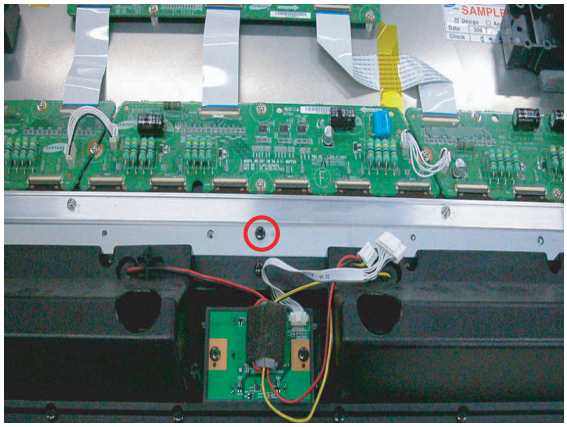
12-1-5 Separation of ASSY PCB MISC-MAIN

Part Name	Description	Description Photo
Main Board	① Remove 5 screws : PH,+,WWP,M3,L8,NI PLT ② Remove all connectors from the board. ③ Remove the Main Board.	

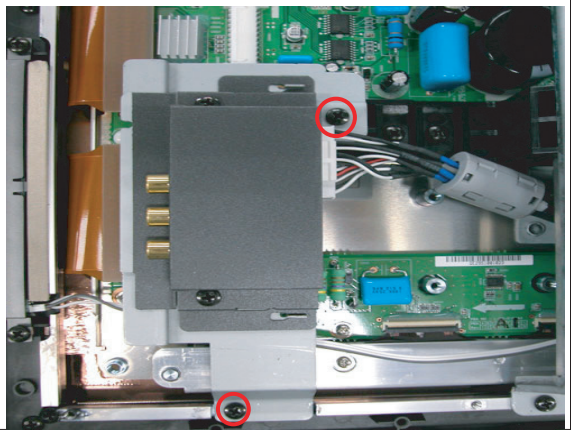
12-1-6 Separation of ASSY COVER P-REAR SUB

Part Name	Description	Description Photo
Rear Sub	① Remove 4 screws. : BH,+,-,S,M4,L8,ZPC(BLK) ② Remove 2 screws. : BH,+,B,M4,L8,ZPC(BLK) ③ Remove the sub cover.	

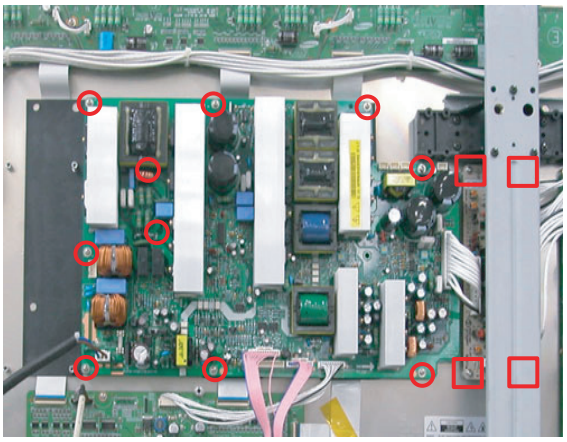
12-1-7 Separation of ASSY SPEAKER

Part Name	Description	Description Photo
Speaker	① Remove 1 screw. : BH,+,-,S,M4,L8,ZPC(BLK) ② Remove the Speaker Assy.	

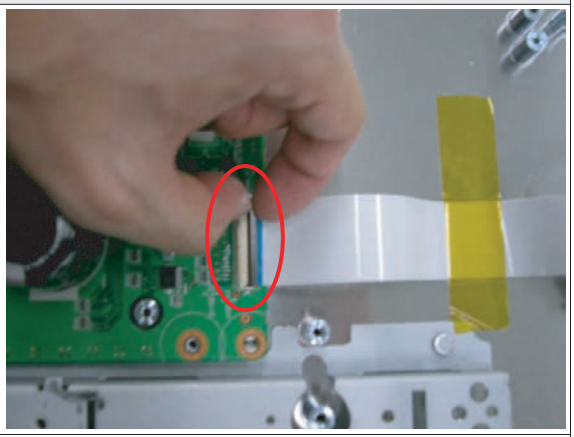
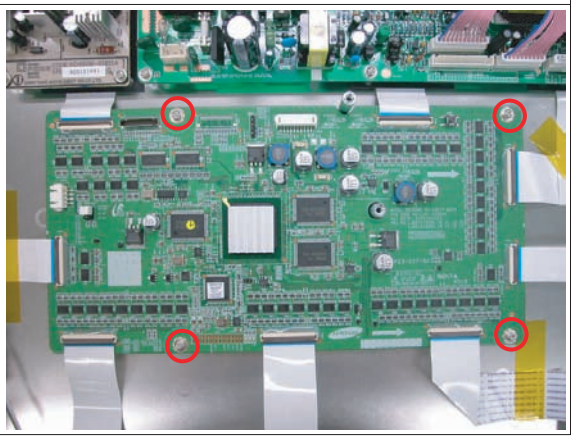
12-1-8 Separation of ASSY SIDE AV

Part Name	Description	Description Photo
Side AV	① Remove 2 screw. : BH,+,-,S,M4,L8,ZPC(BLK) ② Remove the Side AV assy.	

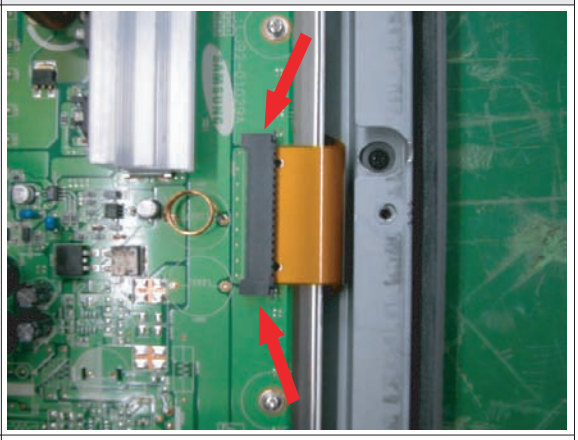
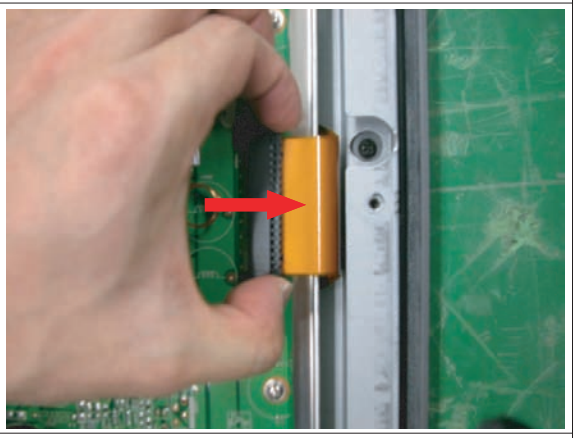
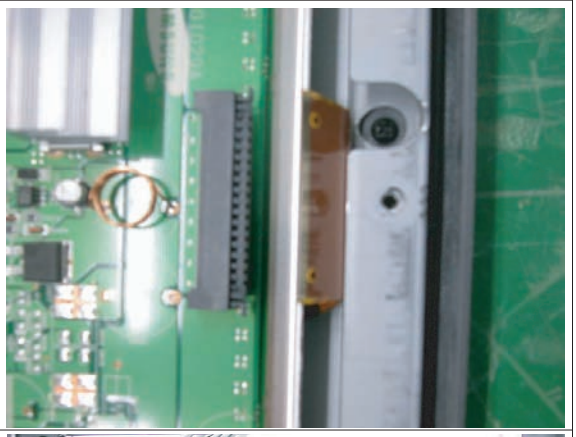
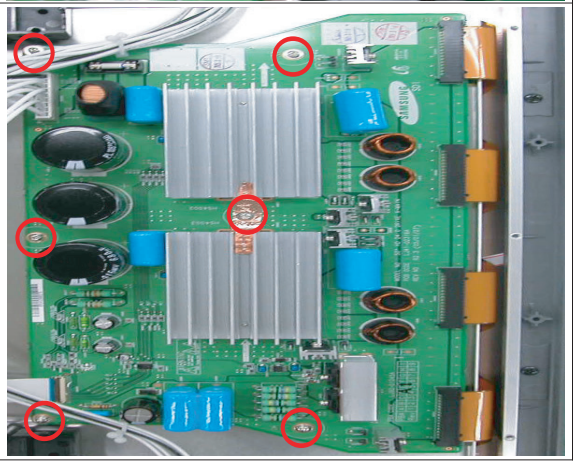
12-1-9 Separation of ASSY SMPS and ASSY SMPS DC-DC

Part Name	Description	Description Photo
SMPS SMPS DC-DC	① Remove 8 screws. : PH,+,WWP,M3,L8,NI PLT ② Detach all connectors from the ASSY SMPS then remove the boards. ③ Remove 4 screws. : PH,+,WWP,M3,L8,NI PLT ④ Detach all connectors from the ASSY SMPS DC DC then remove the board. ⚠ : Wear gloves when handling the power board as there may be some remaining electrical charge in the capacitor. Specifically, avoid touching any part of the capacitor.	

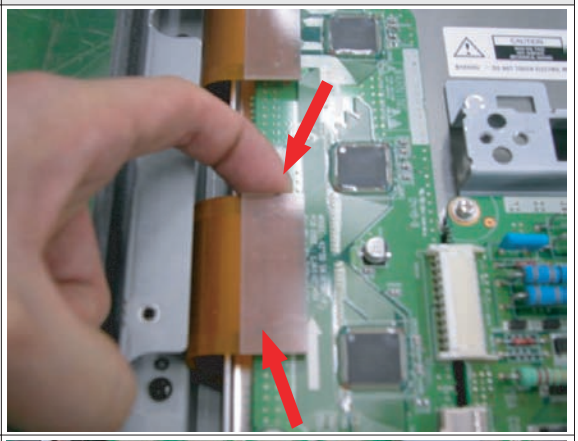
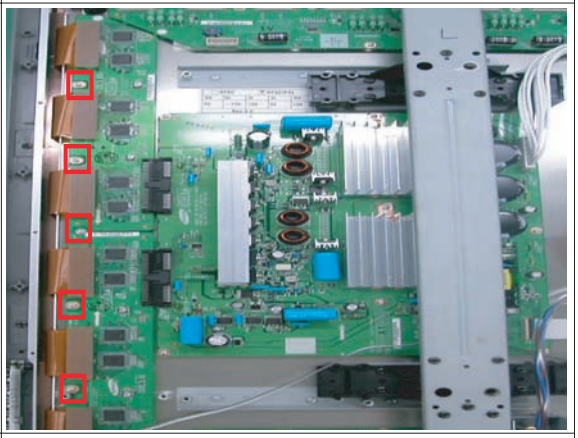
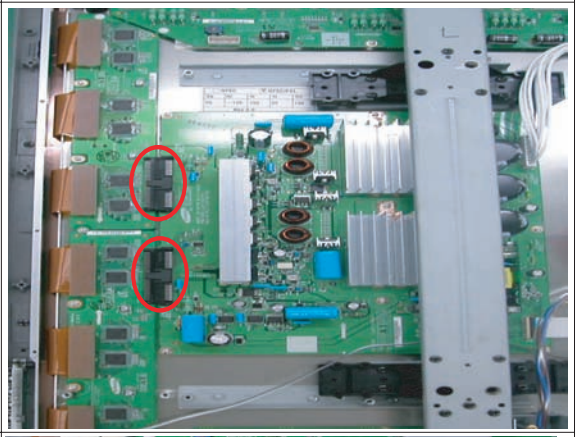
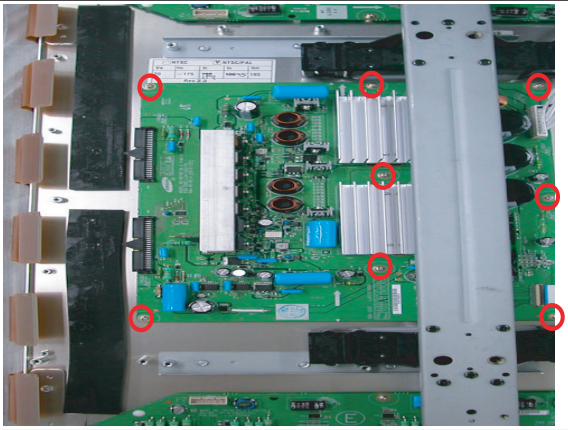
12-1-10 Separation of ASSY LOGIC BOARD

Part Name	Description	Description Photo
Flat Cable	① Take care when separating the Logic Board not to damage the Flat-Cable Connector Cover.	
Logic Board	① Remove 4 screws. : PH,+,WWP,M3,L8,NI PLT ② Remove the Logic Board.	

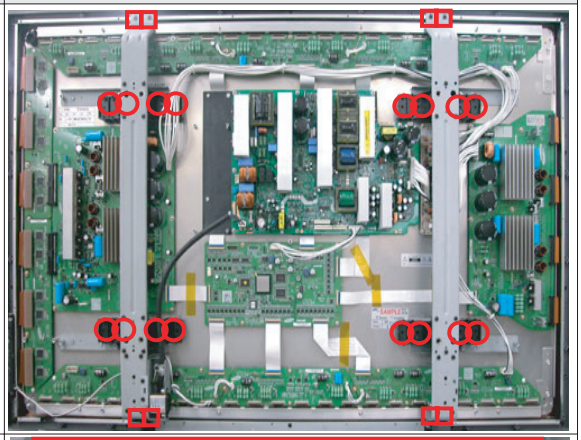
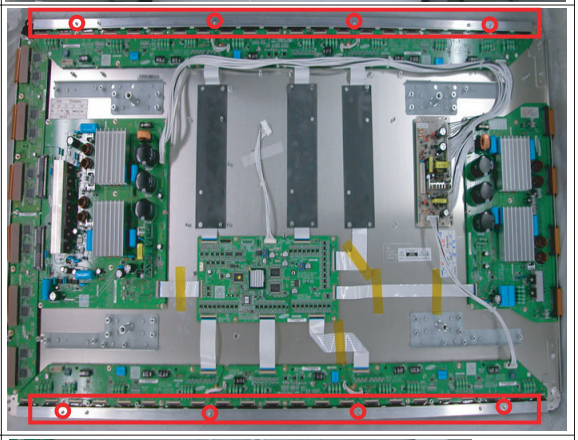
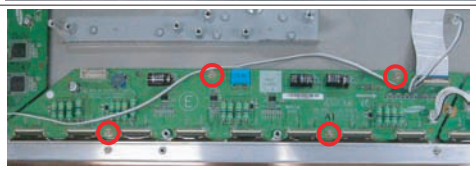
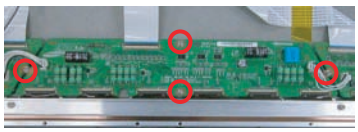
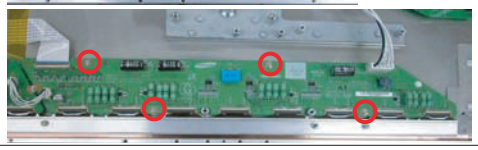
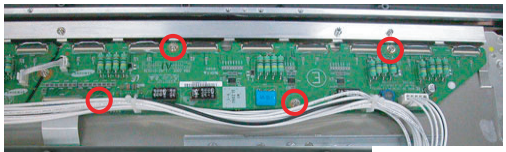
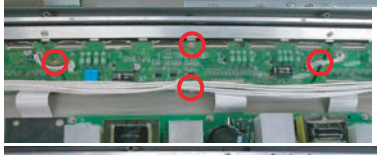
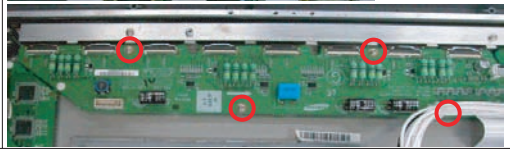
12-1-11 Separation of ASSY X DRIVE BOARD

Part Name	Description	Description Photo
X-Drive Board	① To separate the Flat Cable of the X-Board, press the upper and the lower sides of the connector.	
	① While pressing the connector, apply slight force toward the direction of the cable to release the connector.	
	① Remove the Flat cable.	
	① Remove 6 screws. : PH,+,WWP,M3,L8,NI PLT ② Detach all reamining connectors from the X-Drive Board. ③ Remove the X-Drive Board.	

12-1-12 Separation of ASSY Y DRIVE BOARD

Part Name	Description	Description Photo
Flat Cable	① Detech the 6 Scan Board connectors from the Panel Assy by pulling the holder from both the top and bottom ends.	
Y-Scan	① Remove 5 screws. : PH,+,WWP,M3,L8,NI PLT	
Connectors	① Separate the Scan Boards from the Y-Main Board by detaching the 2 connectors and remove the Scan Boards.	
Y Drive	① Remove 8 screws. : PH,+,WWP,M3,L8,NI PLT ② Detach all connectors from the Y-Main Board and remove the Y-Main Board.	

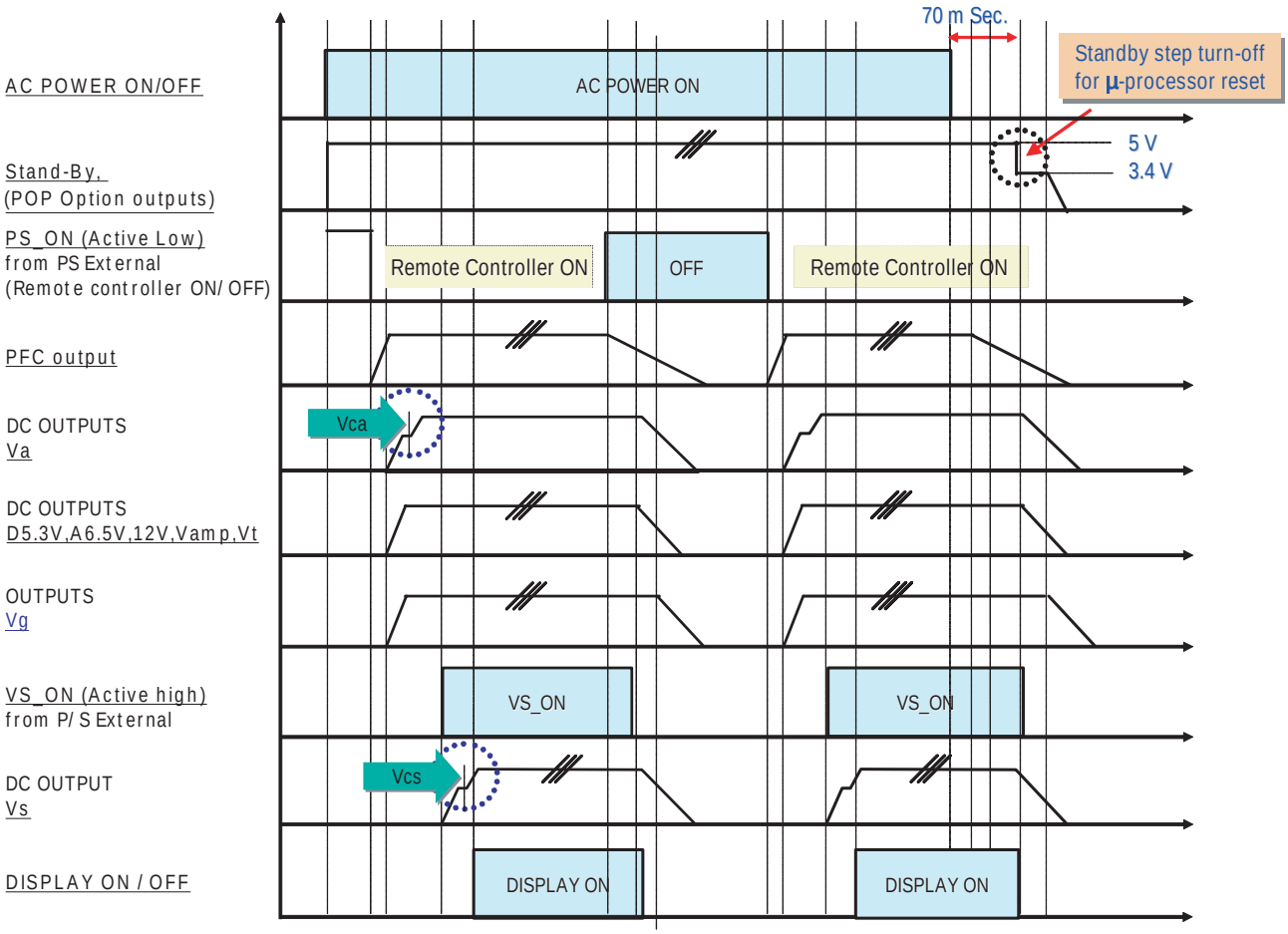
12-1-13 Separation of ASSY BUFFER BOARD

Part Name	Description	Description Photo
Wall Bracket	① Remove 8 screws. : BH,+,-,S,M4,L8,ZPC(BLK) ② Separate PDP module from Front cover. ⚠: Please lay the PDP panel face down on a soft surface when separating front cover. ③ Remove 16 screws. : BH,+,S,M4,L10,ZPC(BLK)	
TCP Cover	① Remove 8 screws. : PH,+,WWP,M3,L8,NI PLT ② Remove TCP covers.	
Buffer (TOP)	① Remove 12 screws. : PH,+,WWP,M3,L8,NI PLT ② Remove the E-Board, F-Board and G-Board.	  
Buffer (BOT)	① Remove 12 screws. : PH,+,WWP,M3,L8,NI PLT ② Remove the E-Board, F-Board and G-Board.	  

MEMO

13. Circuit Description

13-1 Power ON/OFF Signal Timing Sequence



1. When connecting the AC power cord, Stand-By 5V from the Main SMPS is supplied to the Main Board (Pin 3 of CN1002 of Main Board).

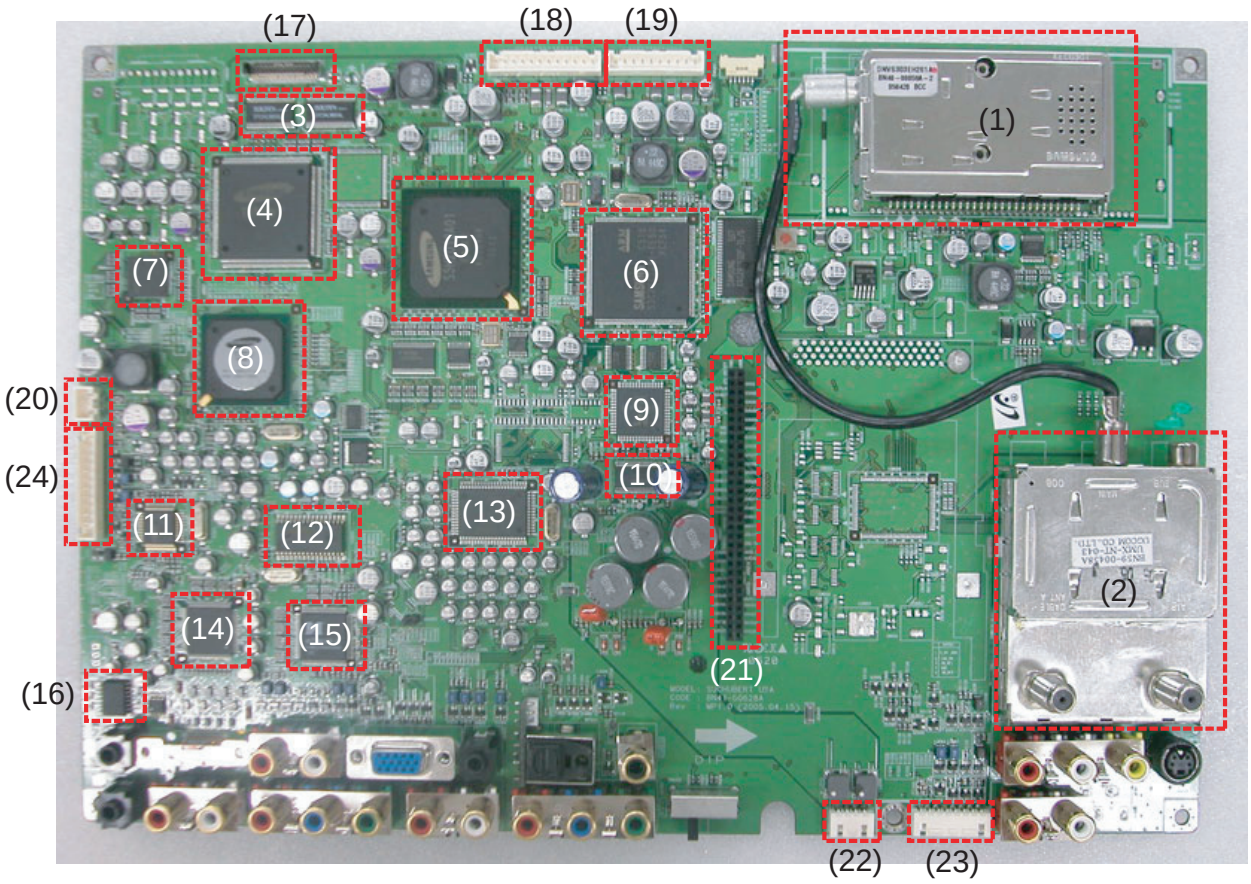
2. When pressing the Power button on the remote control or on the main body, PS_ON (Pin 5 of CN1002 of Main Board) changes from High to Low.

3. If the PS_ON signal changes to Low, the Main SMPS supplies power to the Main Board and Logic Board, and Va and Vg power is supplied to the DC-DC SMPS.

4. If the VS_ON signal from the Logic Board changes from Low to High, the Main SMPS supplies VS power to the X and Y Drive Board through the DC-DC SMPS, and the screen displays a picture on it.

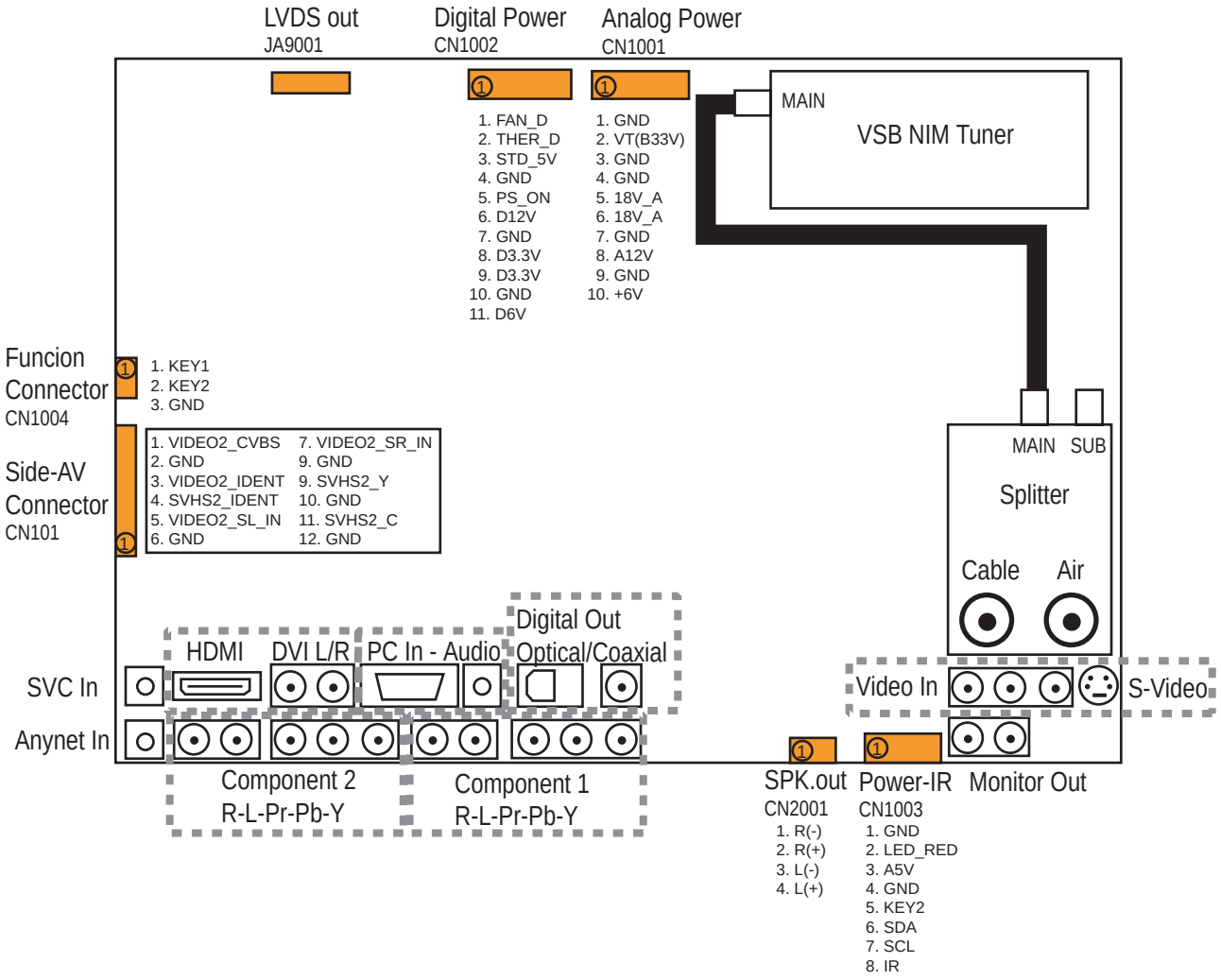
13-2 Partial Block Description

13-2-1 Main Board

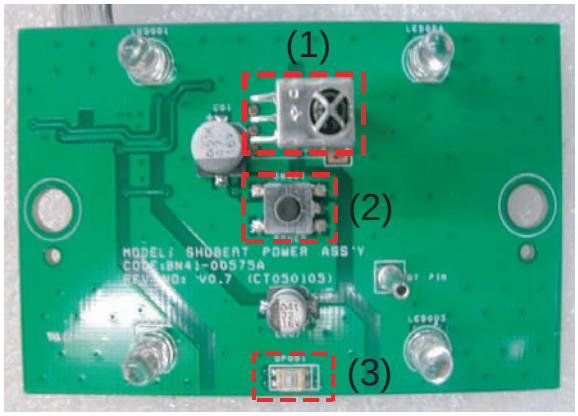


No	Loc. No.	Description
(1)	TU1002 (DNVS303EH261A)	The Main Tuner.
(2)	CN7001 (UMX-NT-043)	The RF Splitter for selecting Antenna IN 1 or Antenna IN 2.
(3)	IC9001,IC9003 (DTC34LM85AL)	Converts the digital R, G, B signals from the main board into an LVDS signal and transmits the signal to the PDP Logic board.
(4)	IC9002 (SDP43)	The DNIe IC for visual quality improvement.
(5)	IC7010 (S5H2010A01)	MPEG Decoder IC.
(6)	IC6006 (S3C2800X01)	CPU IC.
(7)	IC5003 (K4D263238E)	SDRAM for STP22.
(8)	IC5004 (STP22)	A Scaler IC that generates the output resolution appropriate to the PDP panel and generates the PIP screen.
(9)	IC2016 (NSP-6241A)	Sound PWM IC
(10)	IC2015 (TAS5122)	Sound AMP IC
(11)	IC3002 (3F866B)	Generates various control signals required for operating the circuit. The software is downloaded through PC D-SUB Jack.
(12)	IC3003 (P_PCFM_012)	The Micom that inputs and outputs various control signals.
(13)	IC2012 (MSP4440K)	Sound Processing IC
(14)	IC4005 (SIL9993)	Converts the TMDS signal on the HDMI input into 8 bit digital R, G, B signals.
(15)	IC4003 (MST9883)	A/D converts the R, G, B input signal from 15 Pin PC video to 8 bit digital R, G, B signals.
(16)	IC3006 (MAX232)	RS-232 receiver IC
(17)	JA9001	LVDS Logic Connector
(18)	CN1002	SMPS Connector
(19)	CN1001	SMPS Connector
(20)	CN1004	Function key board Connector
(21)	60P CONNECTOR for Debug (Option)	
(22)	CN2001	SPEAKER CONNECTOR
(23)	CN1003	POWER&IR BOARD CONNECTOR
(24)	CN101	SIDE AV BOARD CONNECTOR

13-2-2 Connectors of Main Board

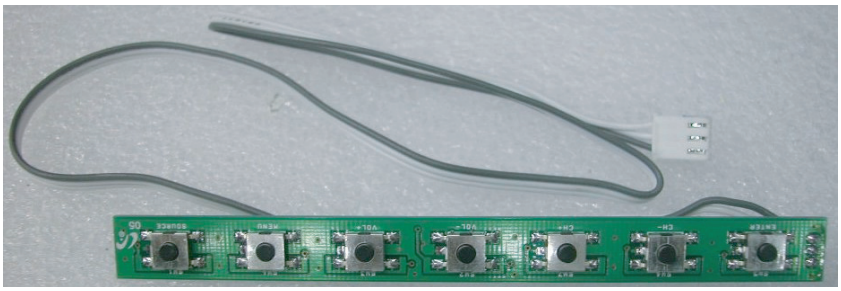


13-2-3 Power Button Board



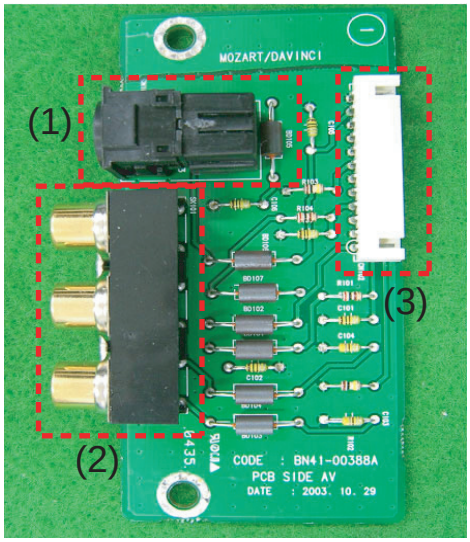
No	Loc. No.	Description
(1)	RM01	Remote Control Sensor
(2)	SW001	Power Button
(3)	OP001	The Illumination sensor that senses the quantity of light. It senses the illumination and automatically adjusts the screen brightness according to the surrounding brightness when the Power Saving Mode of the User menu is set to Auto.

13-2-4 Function Key Board



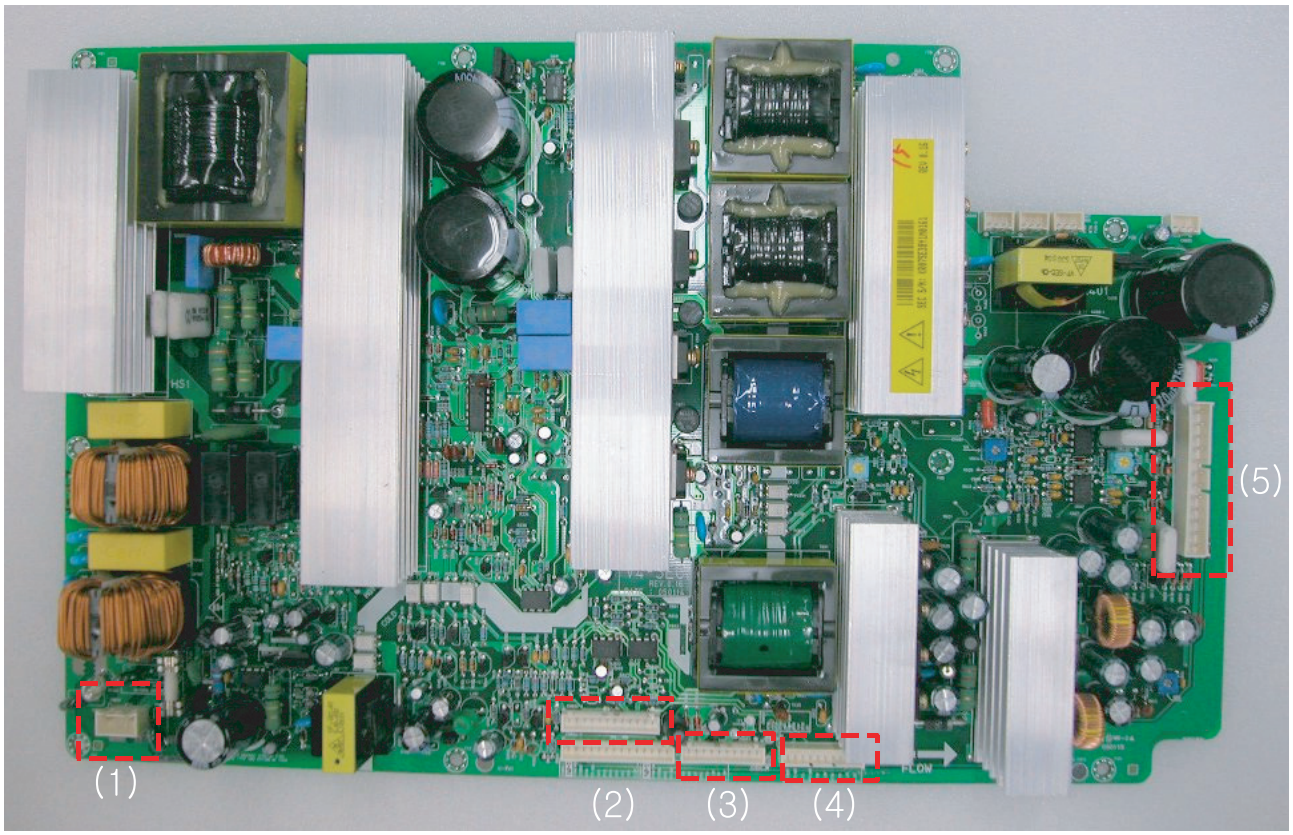
Function Key. Located on the side of the unit.

13-2-5 Side AV Board



No	Loc. No.	Description
(1)	CN101	S-VIDEO2 Input Jack
(2)	SK101	AV2 Input Jack
(3)	CN102	Side AV Connector

13-2-6 Main SMPS



(1) CN800: AC IN (90 ~ 264V)

(2) CN804-1 MAIN SMPS ↔ CN1002(Main B'D)	
Pin No	Signal
1 ■	FAN-D
2	FAN-ON
3	STB5V
4	RTN
5	PS-ON
6	12V
7	RTN
8	RTN
9	VCA
10	VCS
11	RTN
12	5.3V

(3) CN803(MAIN SMPS) ↔ CN1001(Main B'D)	
Pin No	Signal
1 ■	RTN
2	VT(33V)
3	RTN_AMP
4	RTN_AMP
5	18V_AMP
6	18V_AMP
7	RTN
8	12V
9	RTN
10	6V

(4) CN810(Main SMPS) ↔ CN2013(Logic B'D)	
Pin No	Signal
1 ■	5.3V
2	5.3V
3	RTN
4	RTN
5	5.3V
6	RTN
7	PS-ON
8	N.C
9	VS-ON
10	STB 5V

(5) CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N.C
11	Vs
12	Vs

※ CN811, CN806, CN807 and CN808 are not used.

1. Outline (PDP 42inch/50inch SMPS)
Considering various related conditions, the switching regulator with good efficiency and allowing for its small size and light weight was used as the power supply for PDP 42inch(Schubert)/50inch(Strauss), VS requiring high power consumption Asymmetrical Half Bridge converter and flyback converter. To comply with the international harmonics standards and improve the power factor, active PFC(Power Factor Correction) was used to rectify AC input into +400V DC output, which in turns used as input to the switching regulator.

2. Input
The power supply shall be capable of supplying full rated output power over free voltage ranges that are rated 100 VAC - 240 VAC RMS nominal. Operating voltage : 90 VAC - 264 VAC
The power supply must be able to start up under peak loading at 90V AC. The power supply shall automatically recover from AC power loss. (Note that nominal voltages for test purposes are considered to be within +/- 1.0V of nominal).
STD_5V & Vpr2(3.3V) is a SELV standby voltage that is always present when AC mains voltage present.

3. Output

Output Name	Output Voltage	Output Current(Max.)	Using in PDP Driving
VS	+190V ~ 220V (210V)	2.0A	Sustain Voltage of Drive Board
VA	+60V ~ 80V (70V)	3.0A	Address Voltage of Drive Board
D5.3V	+5.3V	5.0A	
A6.5V	+6.5V	3.0A	
FAN_9V	+9V	0.2A	
VG	+15V	1.0A	
D12V	+12V	1.5A	
A12V	+5.3V	0.5A	
18VAMP	+18V	2.5A	Amp Voltage of Audio Board
VT	+33V	0.006A	
STD_5V	+5V	1.0A	Standby for Remote Control

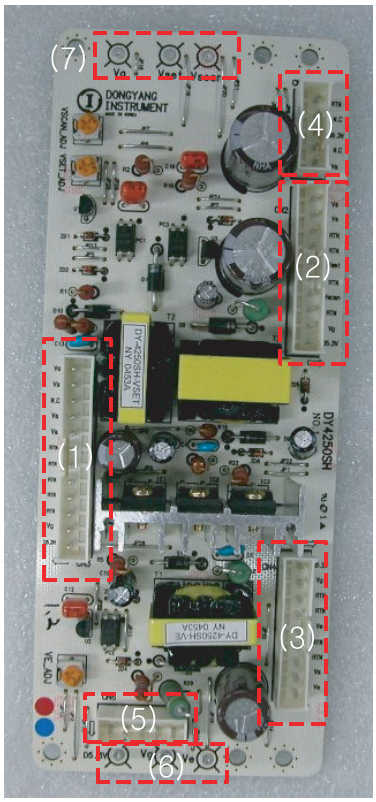
4. Over Voltage Protection
The over voltage sense circuitry and reference shall reside in package that are separate and distinct from the regulator control circuitry and reference. No single point fault shall be able to cause a sustained over voltage condition on any or all outputs.
The supply shall provide latch-mode Over Voltage Protection as defined below.

Parameter	Min	Unit
VS(210V)	250 ~	V
VA(70V)	100 ~	V
VCC(+5.3V)	6.8 ~	V

5. Short Circuit and Over current Protection
An output short circuit is defined as output impedance of less than 300mohms. The power supply shall shutdown and latch off for shorting VS DC rails to return. Shorts between main output rails and STD_5V shall not cause any damages to the power supply.
The power supply shall either shutdown and latch off until the short condition is removed, at which point the P/S shall recover.
The power supply shall be capable of withstanding a continuous short-circuit to the output without damage or over stress to the unit (components, PCB traces,connectors,etc.) under the input conditions specified in Section 3 above. Current Protection as defined below.

Output	Over Current Limit	Unit
VS(210V)	20A, Constant Current.(TBD)	A
VA(70V)	10A, Constant Current.(TBD)	A
Output except Vs,Va	No damage (Auto Recovery or Shut down.)	A

13-2-7 DC-DC SMPS



(1) CN809(Main SMPS) ↔ CN3(DC-DC SMPS)	
Pin No	Signal
1 ■	5.3V
2	Vg
3	RTN
4	RTN
5	RTN
6	RTN
7	RTN
8	Va
9	Va
10	N.C
11	Vs
12	Vs

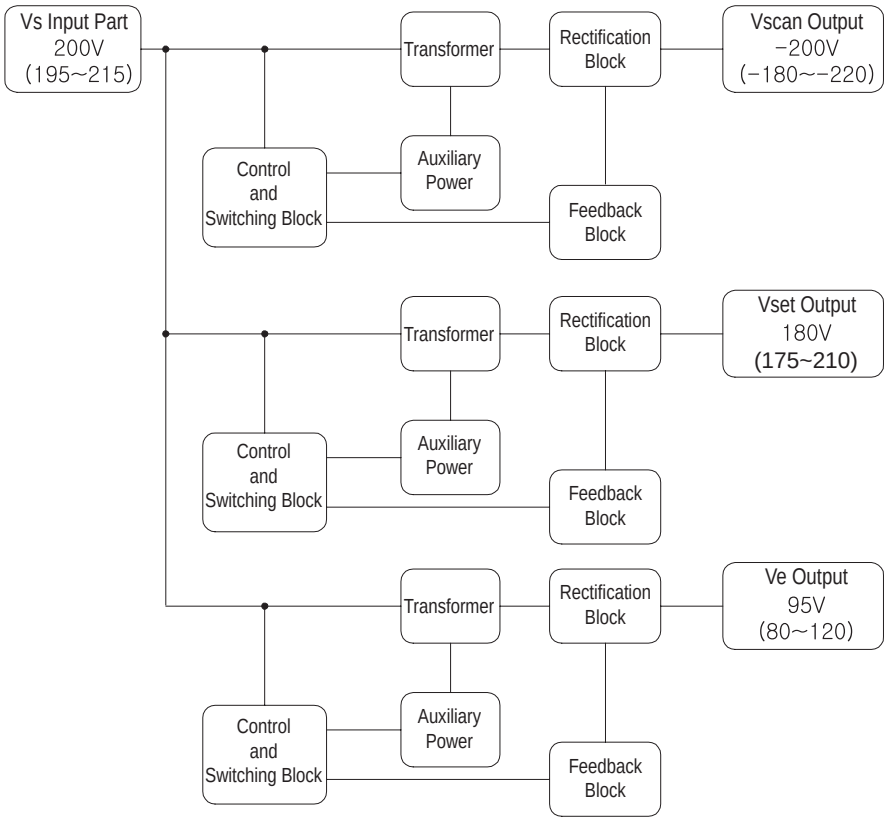
(4), (5) CN1, CN5 (DC-DC SMPS) ↔ CN2501(E-Buffer), CN2710(G-Buffer)	
Pin No	Signal
1 ■	RTN
2	N.C
3	5.3V
4	N.C
5	Va

(2) CN2(DC-DC SMPS) ↔ CN5007(Y B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Vset
6	RTN
7	Vscan
8	RTN
9	Vg
10	5.3V

(3) CN4(DC-DC SMPS) ↔ CN4000(X B'D)	
Pin No	Signal
1 ■	Vs
2	Vs
3	RTN
4	RTN
5	Ve
6	RTN
7	RTN
8	Vg
9	5.3V

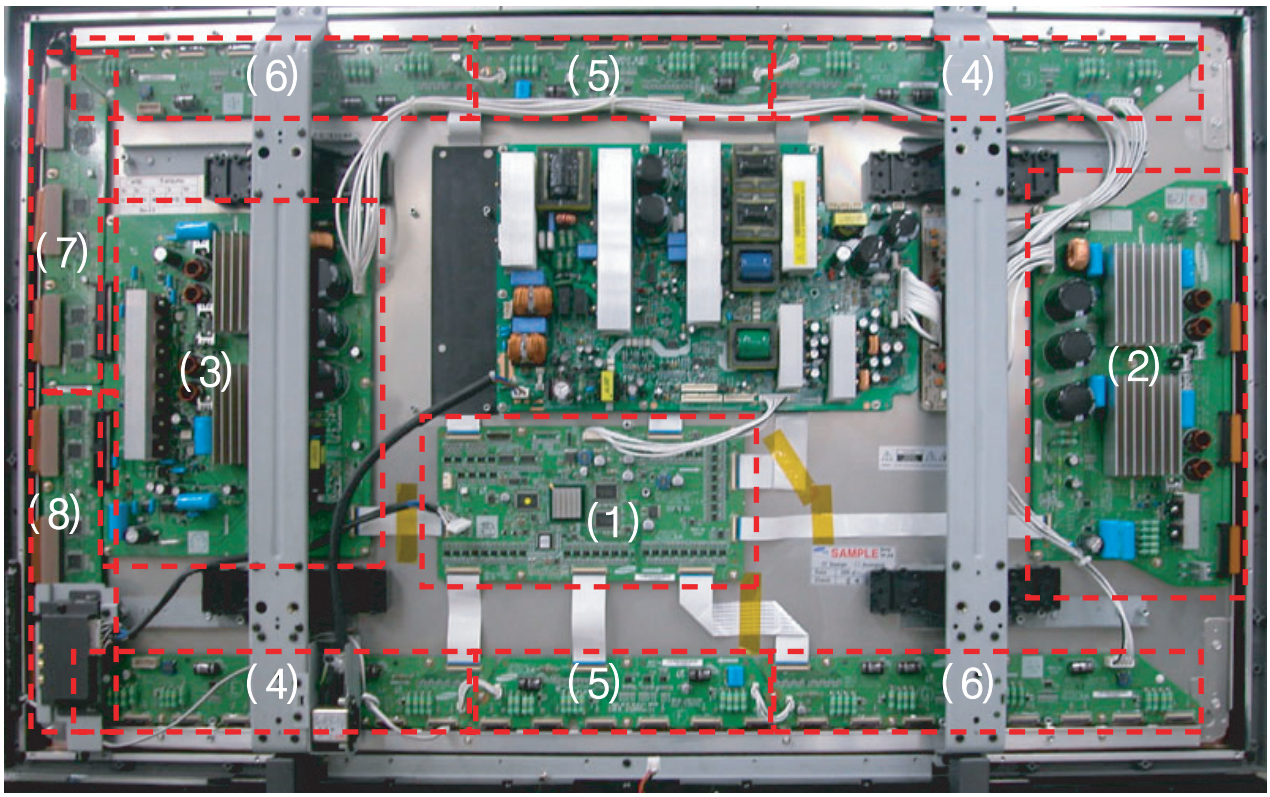
(6) D5.3V, Vg, Ve Test Point
(7) Va, Vset, Vscan Test Point

1. Block Diagram



DC DC SMPS receives Vs input (195~215V) from the Main SMPS and the necessary Vscan, Vset and Ve voltages are output to operate the PDP Module as shown in the block diagram above.

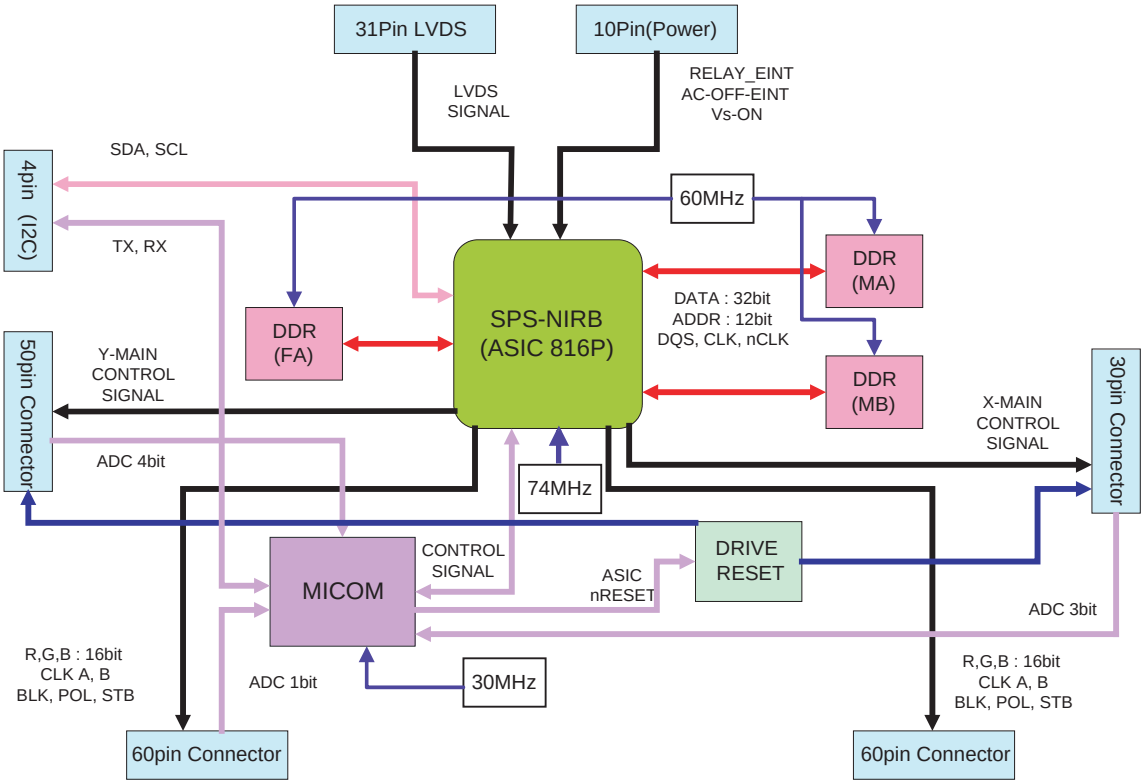
13-2-8 PDP Module



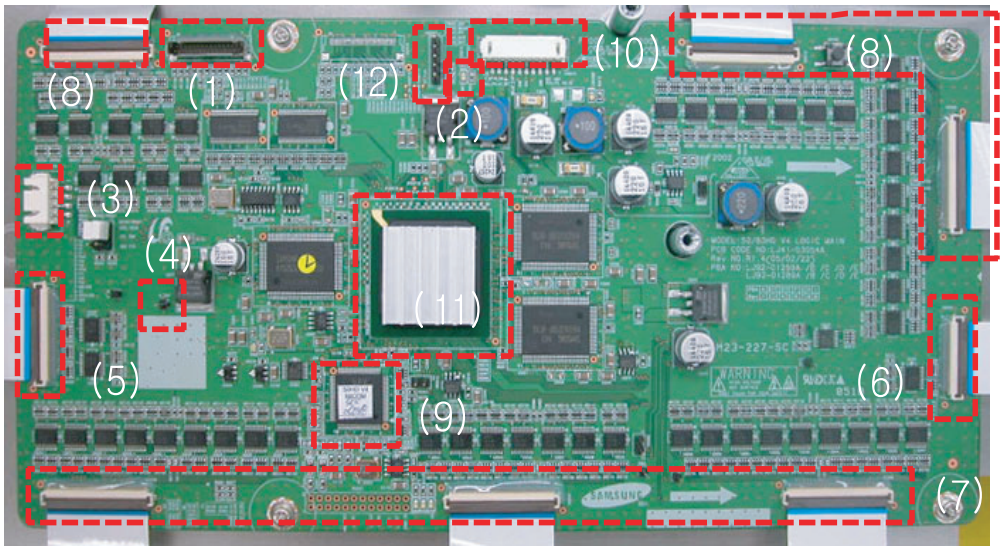
No	Assy Name	Description
(1)	ASSY PDP P-LOGIC BOARD (BN96-02031A)	Logic Main Board
(2)	ASSY PDP P-X MAIN BOARD (BN96-02024A)	X Drive Board
(3)	ASSY PDP P-Y MAIN BOARD (BN96-02025A)	Y Drive Board
(4)	ASSY PDP P-ADDRESS E BUFFER BOARD (BN96-02028A)	Buffer Board
(5)	ASSY PDP P-ADDRESS F BUFFER BOARD (BN96-02029A)	Buffer Board
(6)	ASSY PDP P-ADDRESS G BUFFER BOARD (BN96-02030A)	Buffer Board
(7)	ASSY PDP P-Y BUFF UPPER BOARD (BN96-02026A)	Y Buffer Upper Board
(8)	ASSY PDP P-Y BUFF LOWER BOARD (BN96-02027A)	Y Buffer Upper Board

1. Logic Block

■ Logic Block Diagram



■ A name of main part of Logic Board and vocabulary.



Item	Name	Description
①	LVDS Connector	The connector to receive the RGB, H, V, DATAEN and DCLK signals that have been LVDS encoded through the main board.
②	Operating Status LED (LED2001)	The LED that shows whether the Sync and Clock signal is properly supplied to the logic board (Normal Status:Blinks at 0.8 second intervals)
③	I2C Connector (Debug only)	The connector for the Key Scan board that checks and controls the 512K data.
④	V-TOGG	TP for V Sync Check
⑤	Y Connector	The connector to output the control signal for the Y drive board.
⑥	X Connector	The connector to output the control signal for the X drive board.
⑦	CN2006, CN2007, CN2008	The connector to output the address data and the control signal to the E,F and G-buffer board of BOTTOM.
⑧	CN2009, CN2010, CN2011	The connector to output the address data and the control signal to the E,F and G-buffer board of TOP.
⑨	ARM-PROCESSOR	512K including the Gamma Table, APC Table, drive waveform timing and other options is saved to internal flashmemory.
⑩	Power Connector	The connector to receive power (5V, 3.3V) for the Logic board.
⑪	ASIC CHIP	The main processor that generates and outputs the logic drive signal and the address data.
⑫	MICOM LOADING 5PIN CONNECTOR (Debug only)	The connector to load the Micom drive program. The program is loaded by connecting to the GA-WRITER.

■ About Logic Board

The Logic Board consists of a Logic Main board, which processes the main signal input through LVDS and creates the address driver output and X,Y drive signals, and a Buffer board, which buffers the output signal and outputs the signal to the Address Driver IC (TCP IC).

Logic Board		Function	Remark
Logic Main		- Video Signal Processing (W/L, error diffusion, APC) - Outputs the Address Driver Control and Data Signals to the Buffer board. - Outputs the XY Drive Board Control Signal	
Buffer Board	Lower E Buffer board	Outputs data and control signals to the bottom left TCP IC.	Top and bottom Symmetry design
	Lower F Buffer board	Outputs data and control signals to the bottom center TCP IC.	
	Lower G Buffer board	Outputs data and control signals to the bottom right TCP IC.	
	Upper E Buffer board	Outputs data and control signals to the Top right TCP IC.	
	Upper F Buffer board	Outputs data and control signals to the top center TCP IC.	
	Upper G Buffer board	Outputs data and control signals to the top left TCP IC.	

■ Major Check Points and Waveforms

- The waveform during a Normal Operation

When the PDP set and the Logic Board are properly operating, the Operation Status LED blinks at approximately 0.8 second interval as shown in Figure 1.

If the set is out of order, check the Operation Status LED first, and check that the output waveform is normal using an oscilloscope.

Check if the waveform is the same as shown in Figure 2 by connecting the oscilloscope to the No. 12 TP in Figure 1. Check if the waveform is the same as in Figure 3 by connecting the oscilloscope to the connector that is connected to the Buffer board.

If the measured waveform is different from the following waveforms, the board must be replaced.

To check the waveforms, refer to the following waveform patterns.

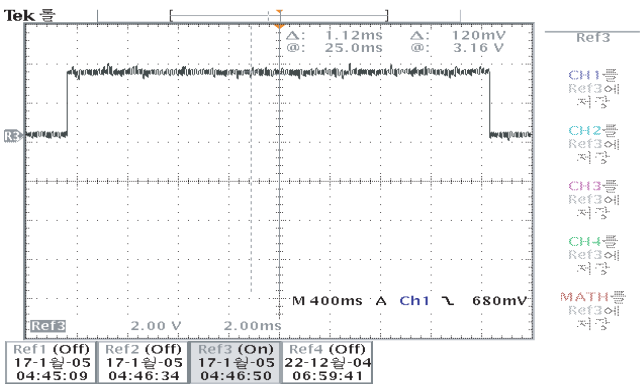


Figure 2. Normal V-SYNC Output Waveform

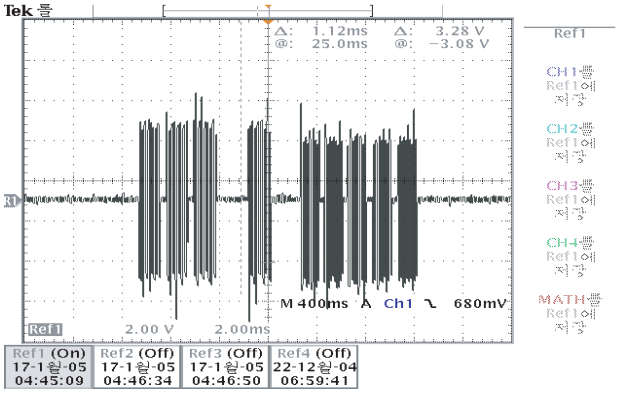


Figure 3. Normal Address Data Output Waveform

1. X, Y Control Block

■ Drive Circuit Definition

The Drive Circuit is a circuit that generates a waveform (high-voltage pulse) for the X and Y electrode group of the panel's external port so as to control the panel. The high-voltage switching pulse is generated through the combination of the IC HYBRID (Drive block + IGBT) and FET.

■ Drive Circuit Mechanism

A picture is displayed on the PDP by applying voltage to the X, Y and ADDRESS electrodes of each pixel according to the appropriate condition. The drive waveform applied to 42HD V4 is of the ISSS (ISSS: Interweaving Scan and Selective Sustain with Scan IC) type and has IDS (InDependent Sustain) in the Scan section unlike the existing ADS. Discharges within a PDP pixel can be classified into 3 types:

① Address Discharge: To form a wall voltage within the pixel by giving information (applying DATA voltage) to the pixel to be lit.

② Sustain Discharge: Sustain Discharge is a display section that voluntarily maintains the discharge of the pixels whose wall voltage has been formed by the Address Discharge. (Optical output for displaying a picture is generated).

③ Erase Discharge: To selectively perform Address Discharge for each pixel, all pixels on the panel should be in the same status (the wall electric charge status and space electric charge status must be the same). Therefore, the Erase Discharge section is an important component for guaranteeing the drive margin, and is implemented by various methods such as applying a log waveform. However, the current 42HD V4 has adopted a wall voltage control through an RA (Repeated Auto-quenching) reset that separates the discharge area and performs switching to perform an efficient erase operation, while the gradient was the same in the RAMP section in the existing approach.

1) Address Discharge

A discharge that is caused by the difference between the plus electric potential (Va apply voltage of 65~70V + Positive Wall Charge) of the electrode and the negative electric potential (Applied GND Level + Negative Wall Charge) of the Y electrode. The Address discharge forms a wall voltage within the pixel to display color (to be discharged) before the Sustain Discharge period. That is, the pixel whose wall charge has been formed by the Address Discharge forms a Sustain Discharge vis the following Sustain pulse.

2) Sustain Discharge

A Sustain Discharge is a Self-Sustaining Discharge formed by the accumulation of the electric potential of the Sustain pulse (generally 200 ~ 210 Volt) alternating over the X and Y electrodes during the sustain period, and the wall charge depending on whether the pixel has previously been discharged or not. That is, it is controlled by the memory characteristics, one of the basic characteristics of the AC PDP (in that the past operating conditions determine the current status). That is, if a wall voltage exists on the pixel (if the pixel is on), a discharge is formed again because the applied voltage, which is the sum of the following applied Sustain voltage and the wall voltage, is higher than the discharge threshold voltage. If no wall voltage exists on the pixel (if the pixel is off), a discharge will not occur because the Sustain voltage is not higher than the discharge threshold voltage. The Sustain Discharge period is the period for generating actual optical output so as to display a picture on the PDP screen.

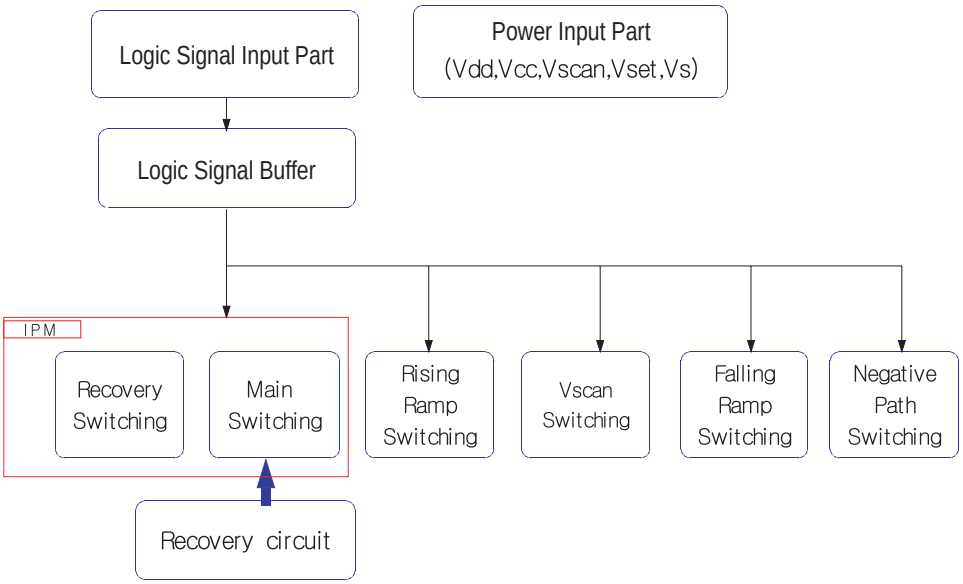
3) Erase Discharge

The purpose of a Reset (Erase) Discharge is to create uniformity of the wall voltage within all panel pixels. It evens the wall voltages regardless of the Sustain Discharge in the previous stage. The Erase Discharge has to remove the wall voltage introduced by the Sustain Discharge by supplying ions or electrons by a discharge. When the wall voltage is removed through a discharge, the time when the reverse polarity is applied to the wall voltage (fine width erasing) is to be limited or ions or electrons are to be supplied by a weak discharge (low voltage erasing) so as to prevent a wall charge in reverse polarity.

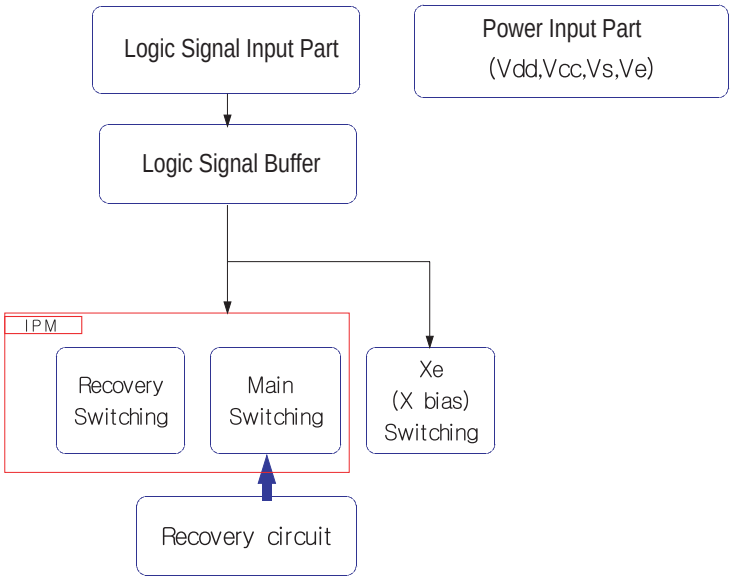
There are 2 known weak discharge (low-voltage) erase methods. 1) A log waveform adopted by F company and 2) a weak erase discharge via a ramp waveform adopted by Matsushita and other companies. Both methods control the externally applied voltage by the difference of the wall voltage of the pixel by applying the rising gradient of the erasing waveform slowly, because the discharge begins when the sum of the existing remaining wall voltage and the rising waveform voltage exceeds the drive threshold voltage. In addition, a weak discharge is introduced, because the applied voltage is low.

■ Drive Circuit Operating Block Diagram

- Y Drive Board



- X Drive Board



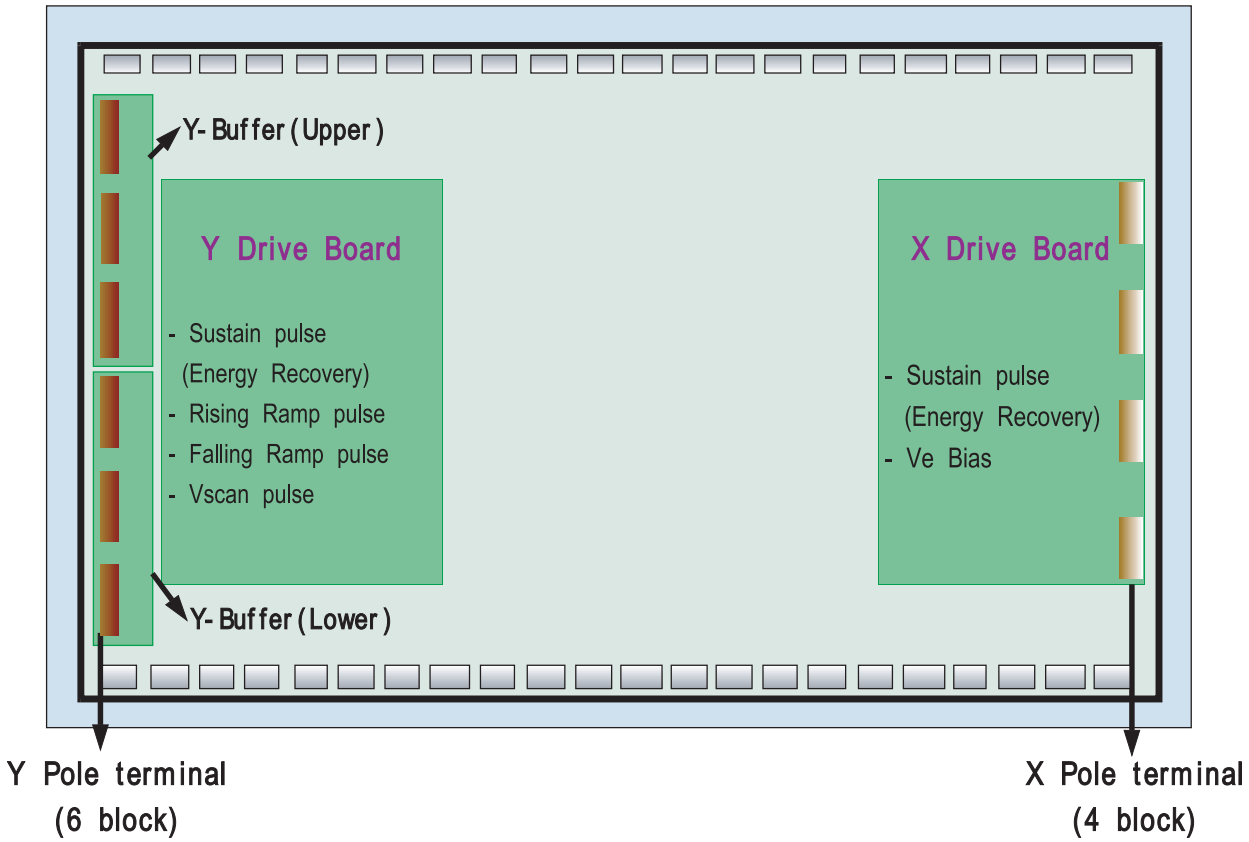
■ Requisite Components Necessary for Drive Board Operation

- Power : Supplied from the power board. The optimal value may differ from the following:
  a) Vs : 205V - Sustain
  b) Vset : 195V - Y Rising Ramp
  c) Ve : 100V - Ve bias
  d) Vscan : -190V - Scan low bias
  e) Vnf : -175V - Y falling Ramp (Created by the DC-DC power block of the Y Drive board)
  f) Vsc_h : -70V - Scan high bias (Created by the DC-DC power block of the Y Drive board)
  g) Vdd : 5V - Logic signal buffer IC and IPM
  h) Vcc : 15V - Gate drive IC ¹× IPM

- Logic Signal : Supplied by the Logic board. Gate signal of each switch

■ Drive Circuit Architecture and Function Description

- Description of the function of each board



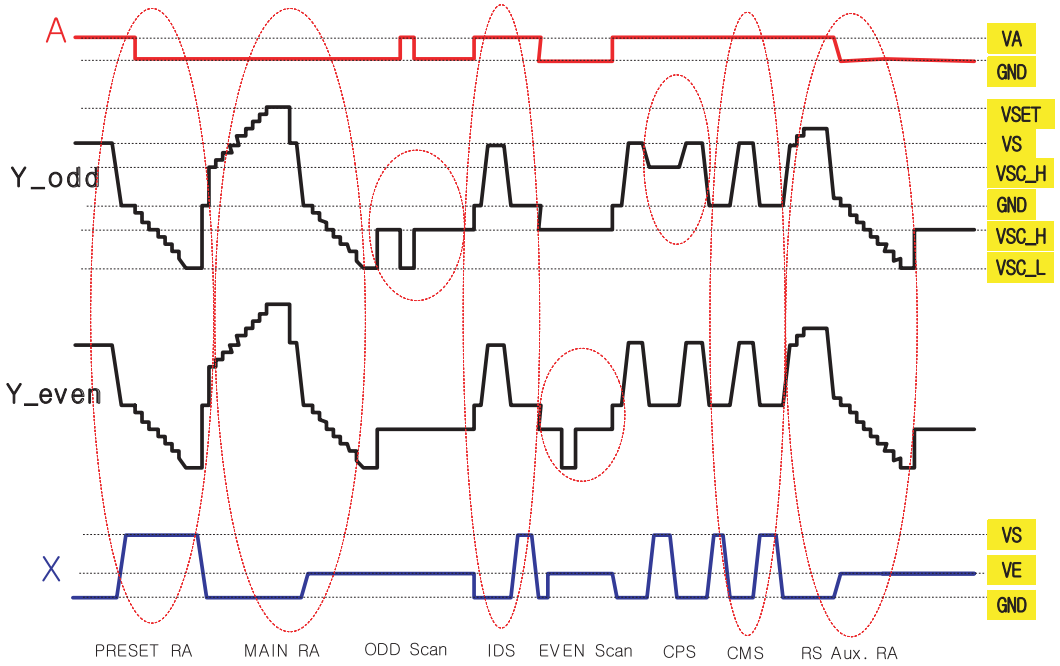
1) X Drive Board
This is connected to the X port part of the panel. 1) Sustain voltage waveform (including ERC) is output, and 2) Ve bias in the Scan section is maintained.

2) Y Drive Board
This is connected to the Y port part of the panel. It outputs 1) Sustain voltage wave form (including ERC), and 2) Y Rising, Falling Ramp waveform, and maintains 3) Vscan bias.

3) Y Buffer Board (Upper, Lower)
This board supplies the Scan waveform to the Y port and consists of Upper and Lower boards. For an HD grade unit, 6 scan driver ICs (TEXAS INSTRUMENT SN755867APZP: 64 outputs) are mounted on the board.

■ Drive Waveform Specifications

- Drive Waveform



- Description of the function of each pulse

1) Y Preset RA Pulse
This is supplied to the first sub-field and erases the discharge status of the previous subfield.

2) Y Main RA Pulse
During the Y Rising Ramp section, approximately 300V~350V (Vscan-h + Vset) of external voltage is supplied to the Y electrode, and a weak discharge is started when each gap voltage is equal to the discharge start voltage. While maintaining the weak discharge, as a whole, negative wall charges are accumulated on the Y electrode and positive wall charges on the X electrode and the address electrode.
During the Y Falling Ramp section, the negative wall charges accumulated on the Y electrode by the approximately 105V of X bias are used to erase the positive wall charges on the X electrode, and the address electrode maintains most of the positive wall charges accumulated during the (0V) Rising Ramp section preparing for the next address discharge.

3) Y Scan Pulse (Odd/Even)
A scan pulse classifies the Y electrode into Odd and Even lines and selects FPC output electrodes sequentially (one line-at-a-time). At this time, Vscan is called the Scan Bias Voltage.
A Vscan voltage of approximately -175 Volt (Vsc_1) is supplied to the electrode lines. For the other lines, -56 volt (Vsc_h is higher than Vscan-l by 120V) is supplied. However, negative wall charges are accumulated on the Y electrode by the Ramp pulse, and positive wall charges are accumulated on the address electrode, and the voltage applied to the cells, to which the Address pulse (70V~75V) has been applied, becomes higher than the discharge voltage. An address Discharge occurs as a result. Since the Scan and Data pulse is applied one line at a time as above, the address time of PDP is very long.

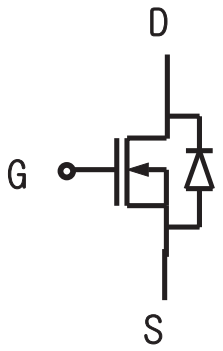
4) IDS Pulse (InDependent Sustain Pulse)
Since an Odd Scan is performed first, the Odd line output sustains optical twice during the IDS section. At this time, a Sustain Discharge does not occur for the Even line because the Even line is not scanned.

5) CPS Pulse (ComPare Sustain Pulse)
By floating the Odd line that caused the Sustain Discharge in the IDS section to the Vscan-h level, and introducing the Sustain Discharge only for Even lines, it compensates for the optical output difference between the Even and Odd lines.

6) CMS Pulse (ComMon Sustain Pulse)
Actual optical is output during the common Sustain Discharge section.

■ Mechanism of the FET Operation and High-Voltage Switching

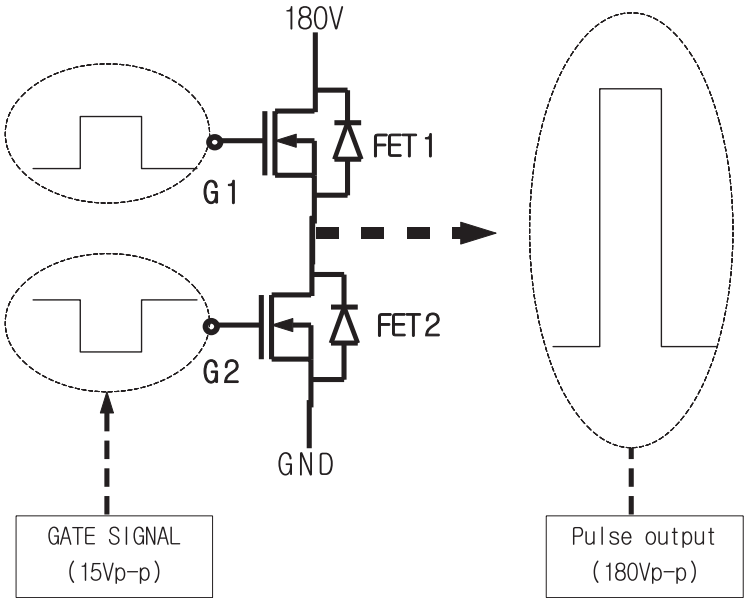
Mechanism of the FET Operation



G : Gate
S : Source
D : Drain

1) When the signal is output to the gate, (positive electric potential) FET short circuits
(i.e. Conductor of resistance 0)
2) When no signal is output to the gate (GND), FET changes to an open circuit (i.e. an insulator of resistance ∞).

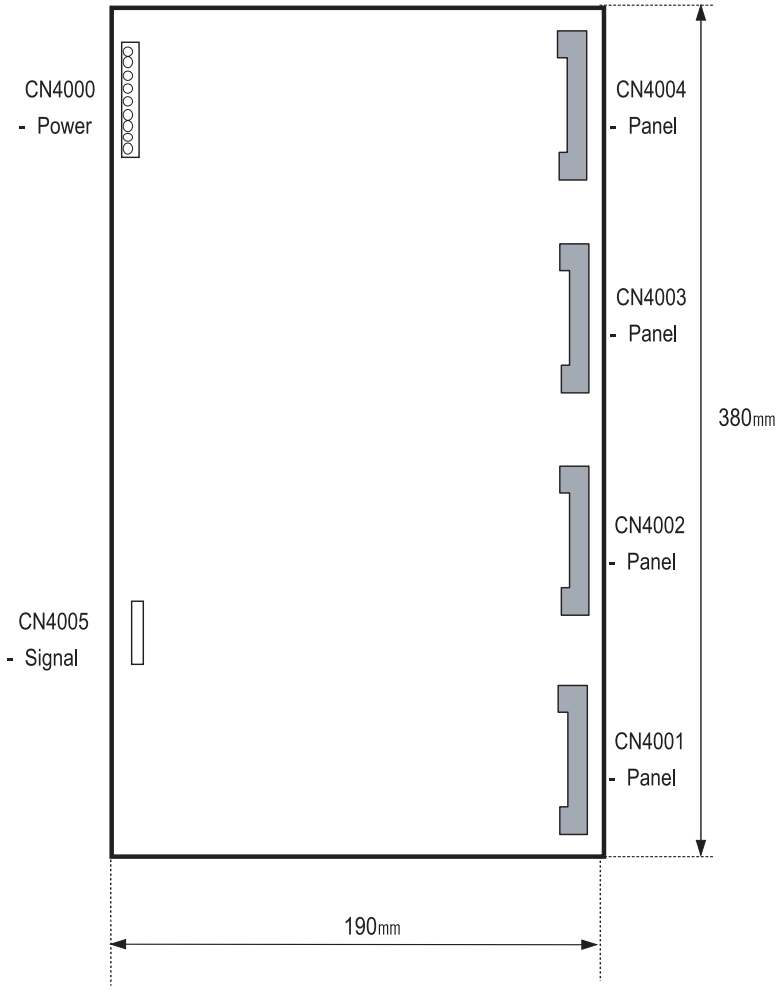
High-Voltage Switching of the FET Operation



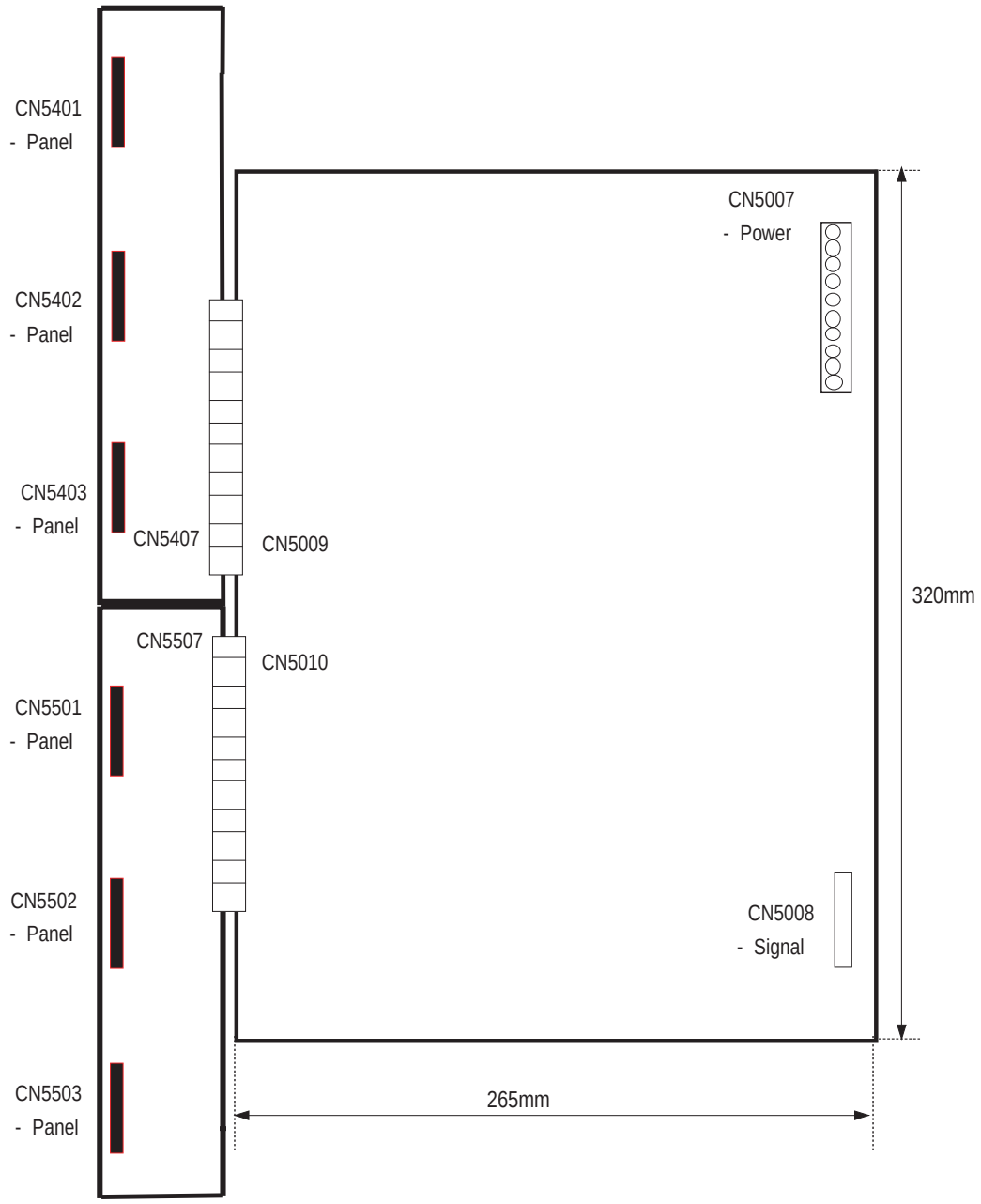
1) When no signal is applied to G1, FET1 is opened and when the signal is applied to G2, FET2 short circuits, GND is output via the output terminal.
2) When a signal is applied to G1, FET1 short cir cuits and when no signal is applied to G2, FET2 is opened, and 180V is output via the output terminal.

■ Drive Board Connector Layout

1) X-Main



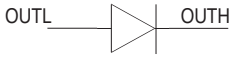
2) Y-Main


CN5401
- Panel
CN5402
- Panel
CN5403
- Panel
CN5407
CN5009
CN5507
CN5010
CN5501
- Panel
CN5502
- Panel
CN5503
- Panel
CN5007
- Power
CN5008
- Signal
320mm
265mm

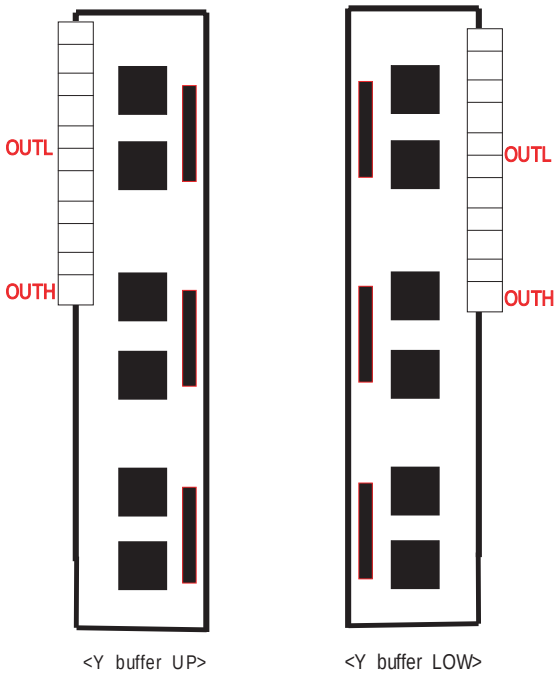
■ Troubleshooting the Drive Board

1) Y Buffer

- To check whether the Y Main board is properly working, check the operation of the Y Buffer first.
- Separate the connector of the Y Buffer from the Y Main board.
- Check OUTL and OUTH and confirm that the forward voltage reduction is between 0.4V ~ 0.5V.
  UP - CN5407 1~10pin - OUTH / 11~33pin - OUTL
  LOW - CN5507 50~41pin - OUTH / 40~17pin - OUTL



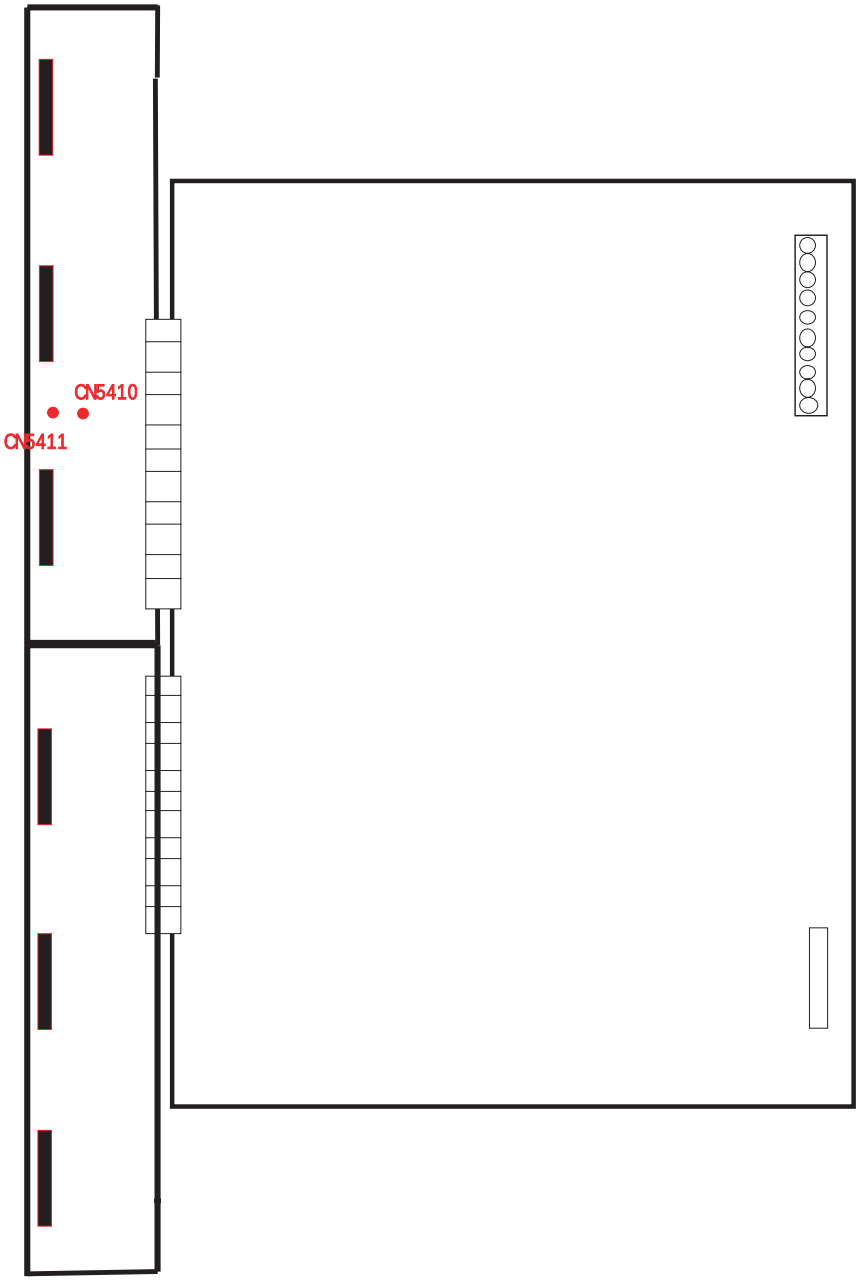
- In addition, the resistance between the points must be higher than a few kΩ .



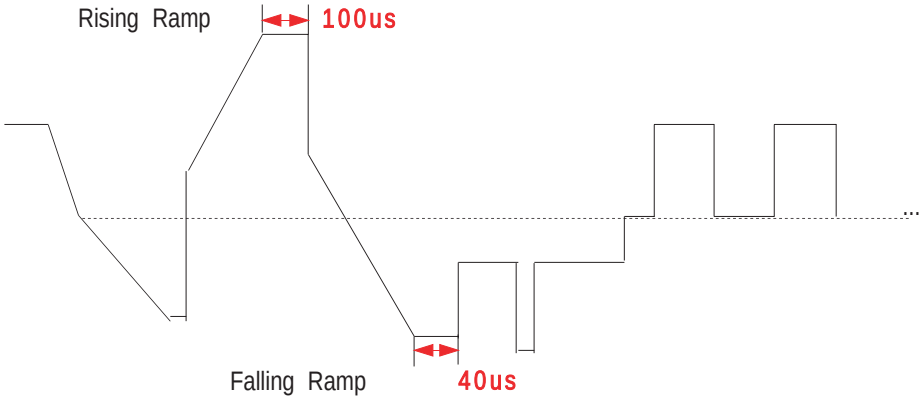
<Y buffer UP> <Y buffer LOW>

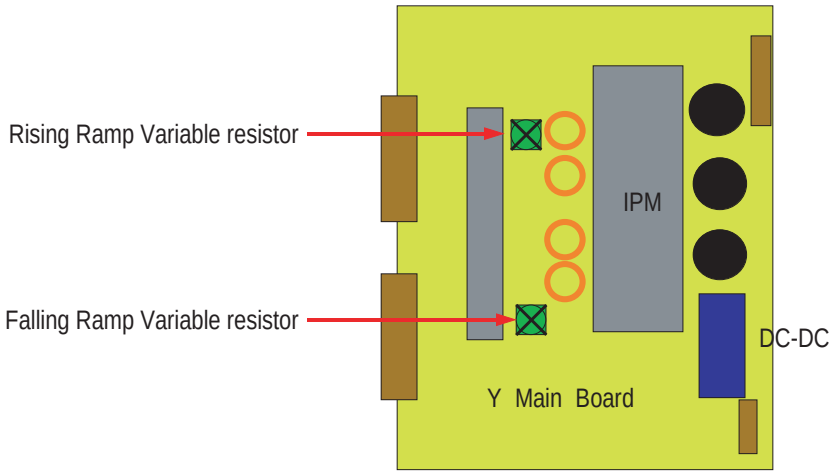
2) Y Main

- Connect the Y Main and Y Buffer, and confirm that the output from TP(CN5410, CN5411) of the Y Buffer UP is the same as #Attachment 1 when the power is supplied.



▶ Adjust the drive waveform so that the main reset (Rising: 100 usec, Falling: 40 usec) are the same as those in the figure.

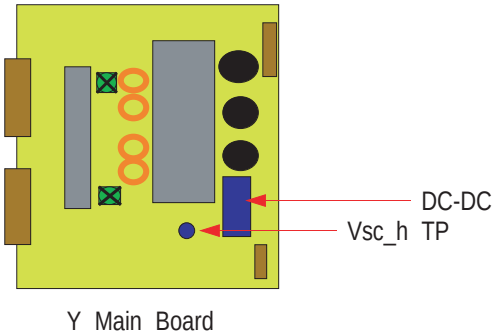




<Voltage Adjustment Specifications>

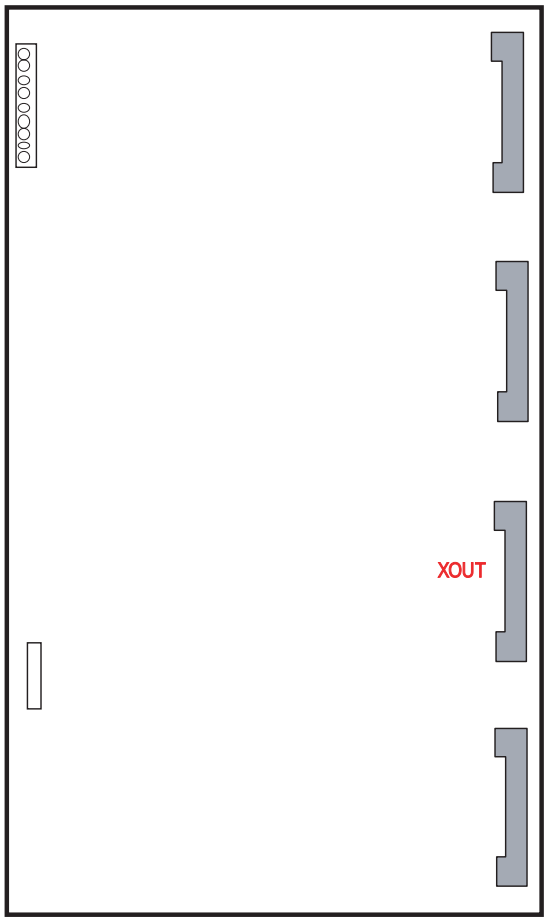
Vset	Vs	Vsc_l	Vsc_h	Ve	Va
200V	205V	-175V	-56V	105V	70V

※ The Vsc_h and Vnf voltages are controlled by the DC-DC power part of the Y Main board.



3) X

- Check that the output of X-Out of the X board follows the waveform of #Attachment 2 when the power is supplied.



※ Attachment 1

■ Y Output Waveform

The Scan Waveform Must Be Observed
File Edit Vertical Horiz/Acq Trig Display Cursors Measure Math Utilities Help
Tek Run Sample
Buttons
Max(C2) 400.0mV
Ch1 5.0V
Ch3 100V
M 200us 1.25MS/s 800ns/pt 2.48ms
A Ch1 1.5 V

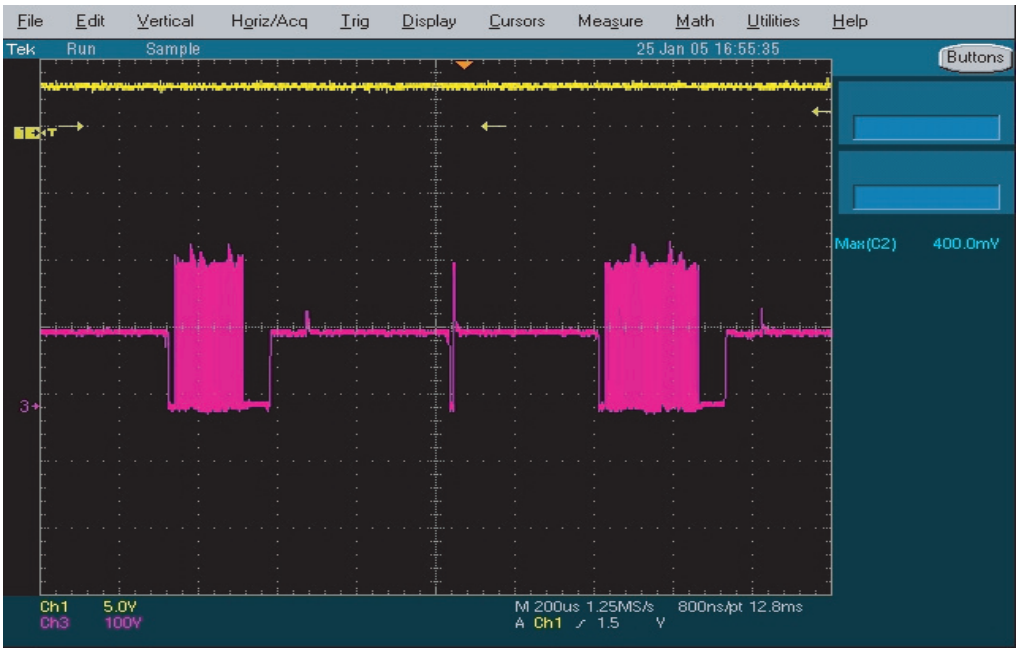
Y Output Waveform (200us/div, 100V/div)

File Edit Vertical Horiz/Acq Trig Display Cursors Measure Math Utilities Help
Tek Run Sample 25 Jan 05 16:53:46
Buttons
Max(C2) 400.0mV
Ch1 5.0V
Ch3 100V
M 2.0us 125MS/s 8.0ns/pt 13.4ms
A Ch1 1.5 V

1us/div, 100V/div (Sustain Waveform)

※ Attachment 2

■ X Output Waveform


File Edit Vertical Horiz/Acq Trig Display Cursors Measure Math Utilities Help
Tek Run Sample 25 Jan 05 16:55:35
Buttons
Max(C2) 400.0mV
Ch1 5.0V
Ch3 100V
M 200us 1.25MS/s 800ns/pt 12.8ms
A Ch1 ⟋ 1.5 V

X Output Waveform (200us/div, 100V/div)

File Edit Vertical Horiz/Acq Trig Display Cursors Measure Math Utilities Help
Tek Run Sample 25 Jan 05 16:54:56
Buttons
Max(C2) 400.0mV
Ch1 5.0V
Ch3 100V
M 2.0us 125MS/s 8.0ns/pt 13.3ms
A Ch1 ⟋ 1.5 V

2us/div, 100V/div (Sustain Waveform)

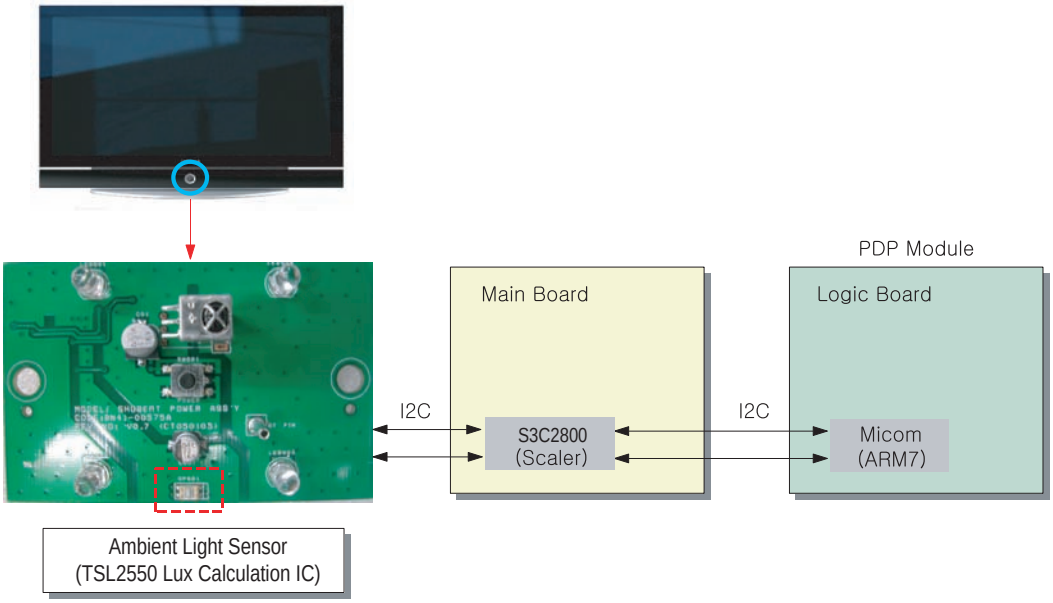
13-3 New Circuit Description

13-3-1 Power Saving Modes (Standard, Automatic, Super Power Saving)

1. Objective

To enhance a sensible visual quality by maintaining an appropriate screen brightness according to the ambient brightness and to reduce power consumption.

2. Circuit Architecture



The CPU S3C2800 of the Video Board monitors the current ambient brightness (in Lux units), stored in the Ambient Light Sensor of Power Assy., which is attached at the front of the PDP, at given intervals through SMBUS communication (identical to I2C) and controls the PDP module to operate at the appropriate luminance level.

3. Descriptions of Each Mode

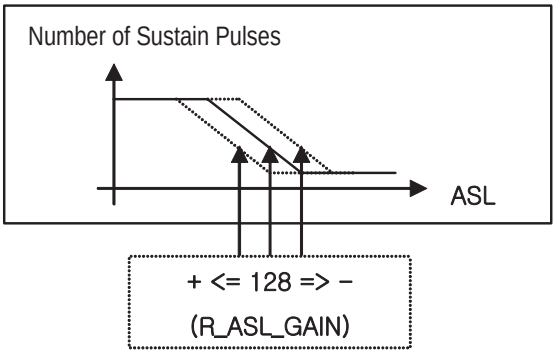
1) Standard Mode

Standard Mode is set as standard visual quality.

2) Auto Power Saving Mode (Ambient Light Sensor)

This uses the TAOS 4 pin TSL2550 and is currently being used in LCD TVs. It also uses SMBUS, which is the same type as I2C, for communication. The Ambient Light Sensor can detect up to 1846 Lux in normal mode. The data of the sensor can be measured for Lux operations once every 800ms.

Control is implemented by using R_ASL_GAIN. The number of sustain pulses moves left or right as shown in the figure on the right. For a low gradation condition, the change by R_ASL_GAIN has been minimized considering the degradation of the visual quality. That is, the Auto Power Saving mode screen controlled by the ambient light sensor aims at normal video of medium gradation.



※ The following values are for a normal air signal with 80 Watt attenuation at maximum

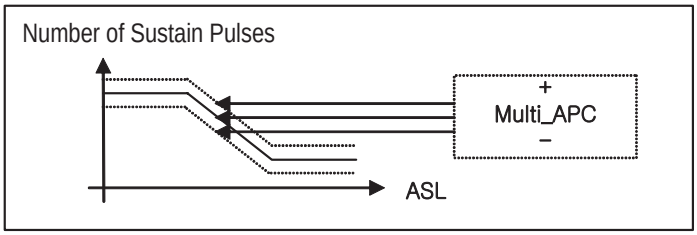
Detected Lux	R_ASL_GAIN (Address 0xE9)	Remarks
0 ~ 8	250	- Read the Lux value once per second and change it the target R_ASL_GAIN value by 5 per second according to the changed Lux value. - If more than 3 communication errors or saturation (count1>count0) is detected, the default value is set (R_ASL_GAIN=128).
9 ~ 22	210	
23 ~ 35	170	
Else	128 (default)	

3) Super Power Saving Mode

This uses the Multi APC function of the PDP module, and aims at reducing power consumption more than 100 W for the white pattern, which is similar to the power consumption reduction of other manufacturers.

- Concept of Multi APC

: Controls the number of sustain pulses according to the ASL (Average Signal Level) by R_P_Lower_Gain value.
In the PDP Logic, R_Multi_APC is set to 0X01, Multi_APC operates, and R_P_CM_Gain_SW is set to 0X01 so that the upper and lower limits of the APC Table can be shifted by adjusting the R_P_Lower_Gain value only.
Therefore, the sustain pulse is controllable for the white pattern, even though it was formerly not controllable.



※ Caution: The Super Power Saving Mode screen is darker than that of Standard Mode.

MEMO

14. Reference Information

14-1 Other issues related to other products

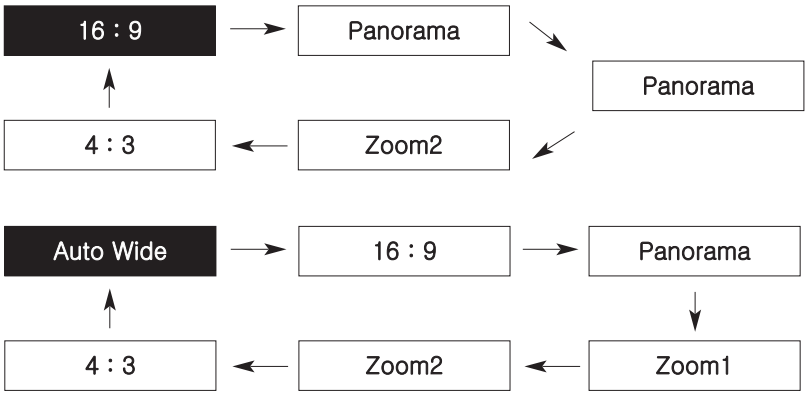
Problem	Descriptions
A fixed screen can cause permanent damage to the TV Braun tube.	Braun, PDP and LCD TVs can all be damaged. When a still image is displayed in a sequence, this can leave stains or after-images due to the characteristics of the panel. However, the DLP TV has the advantage that no stains or after-images are left on the screen. The DLP TV has mirror pixels on the DMD panel that project the beam onto the screen, in which the mirror is a digital representation of 0s and 1s, leaving no trace of light. The mirror returns to a blank state so that no stains or after-images are left.
Confusion between the ANYNET Port and the SERVICE Jack Port	The SAMSUNG SKY500N model has both an ANYNET port and a SERVICE jack port. Because the shape of the ANYNET port on the DLP TV is the same as that of the SERVICE jack port of the SKY500N, it fails to turn the TV off after a connection has been reported. The ANYNET port uses an RS232 port called Phone Jack, and the SERVICE jack port also uses the RS232 port. However, you must not connect the SERVICE port and the ANYNET port. Check if the port is the ANYNET port or the SERVICE port before connecting the port. Even if the TV cannot be turned on after connecting, the TV will turn on if you disconnect the connection.
Length of DVI Cable / PC RGB Cable	- A too long DVI cable may cause a malfunction or degradation of the visual quality due to an attenuation of the signal. There is no recommendation for the cable length at present. In general, although a cable length of up to 5 meters should work, please check if video is properly displayed on the screen after connecting. If you think the length of the cable is longer than for normal use, check the visual quality of the video on the screen and shorten the length, if necessary. - This also applies to the PC RGB (D-Sub) cable. When the length of the cable is longer than for normal use, video may not be displayed on the screen. In this case, shorten the cable length.
When a digitally distributed TV user receives HD-rated broadcasts:	The digital distributed TV (Ready Technique) can render HD sources as HD-rated. However, you need to install a set-top box for this purpose. The digital TV alone cannot render HD broadcasting as HD-rated. Install the formal set-top box for HD broadcasts.
When a digital distributed TV user selects normal size (4:3) to receive SD-rated digita broadcasts:	The digitally distributed TV (Ready Technique) renders any broadcasting service as SD-rated. However, when connected to a set-top box, the digital TV renders HD broadcasts as HD-rated and renders SD as SD-rated. The screen size is scaled to 4:3.
When a digitally built-in TV user receives SD (air) broadcasting:	The digitally integrated TV ("built-in" type) renders SD broadcasting as SD-rated. This can be understood easily. Even a high-resolution TV cannot improve a low resolution picture into high quality. In contrast, an SD-rated TV cannot represent HD broadcasting as HD because the resolution of the TV is lower than the original.
When selecting a picture size of 4:3 in connection with a computer or a multimedia device:	The representation capability of SD or HD-rated depend entirely on the TV set. The HD TV can render HD broadcasting as HD-rated only when it receives HD sources. In the meantime, the HD TV renders SD as SD-rated when it receives SD sources. The picture size has nothing to do with the resolution; TV models like SVP-XXL3HD or SVP-XXL6HD have a size adjustment feature to 16:9, 4:3, Panorama, Zoom1, Zoom2 and Auto Wide. This is about the aspect ratio of the top and bottom boundaries to the overall screen and users can select their preference.

■ SD/HD broadcasts and the TV's display capability are related

1. A digital broadcast should be transmitted in wide screen (an aspect ratio of 16:9) HD. If the broadcasting station converts a conventional program created in normal screen (aspect ratio of 4:3) into a digital signal and broadcasts the signal, the left and right of the picture will not be displayed.
   This symptom also appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.
   * When watching an SD (normal) broadcast through a Digital (Wide) TV (480P normal broadcast)
   * When watching an SD (normal) broadcast through a Digital Ready (Wide) TV (Using a set-top-box)
   * When watching an analog (normal) broadcast through a wide TV
     (When watching a broadcast after changing the aspect ratio of the TV from 16:9 (wide screen) to 4:3)

2. When watching a DVD title or video tape in wide screen (21:9) through a wide (16:9) TV, watching video from a computer or game console by selecting the aspect ratio to 4:3, or watching video from a DVD, VCR, computer or game console through a wide TV by selecting the aspect ratio to normal (4:3) or wide (21:9), the left and right, or top and bottom of the picture will not be displayed.
   This symptom appears in other manufacturer's TV's. The three appliance companies are trying to resolve the problem through the Ministry of Information and Communication.

■ Changing the Order of the Picture Size for 16:9 Display Devices



■ Changing the Order of the Picture Size for DTV 1080i/720p Sources

■ Restrictions

1. When you want to change the picture size in PIP 'ON', you must turn the PIP off before changing the size.
   However, you can change the main picture size even in PIP ON for products with no restrictions.

2. When the picture size is not Normal (4:3 for 4:3 display devices, 16:9 for 16:9 display devices) and you turn PIP on, the picture size is changed to Normal.
   However, you can turn PIP on without changing the picture size for products with no restrictions.

3. In the OSD notation for the picture size, 16:9 is represented as "Wide" instead of "16:9" for devices other than with 16:9 dis plays.
   Ex: For LCD 15:9 devices, "Wide" is displayed on the OSD instead of "16:9".

4. The picture size can be changed even in the blue screen.
   However, the picture size should be controlled by the product specifications if the change is impossible due to hardware restrictions.

14-2 Technical Terms

Virtual Channel
In digital channels, a virtual channel is used. A virtual channel is a function that enables users to watch a channel by selecting a virtual channel number regardless of the region of the user. Run Auto Channel Scan for digital broadcasts, tune in to a UHF channel number according to the region for terrestrial broadcasts, or tune into a channel number allocated by the cable broadcasting station for a cable TV network, and then select a displayed virtual channel.
For example, even if you tune into channels UHF 14(MBC), 15(KBS1), 16(SBS), 17(KBS2) and 18(EBS) broadcast from Kwanak mountain in Seoul, you can watch the channels using virtual channels such as 11-1(MBC), 9-1(KBS1), 6-1(SBS), 7-1(KBS2) and 10-1(EBS) regardless of your region and the actual local channel number. The virtual channel numbers may be used nationwide, but the virtual channel numbers may vary depending on the local broadcasting stations.
(Since the digital channel numbers may vary depending on your region and can be changed by the broadcasting policy, ask your local broadcasting station or regional cable TV network company about the channel numbers.) If the virtual channel numbers are saved and the TV set can receive digital broadcasting, you can watch a digital channel by pressing the DTV+ button and pressing the first two digits of the corresponding virtual channel number.

Custom Color Adjustment
Using this function, a user can adjust the color according to personal preferences (Red, Grass-Color, Sky-Color, Gold-Color, Skin-Color, White, Standard, Custom) without affecting other colors using automatic selection mode or fine adjustment mode.

Simultaneous Screen
Using this function, a user can view two video signals from separate video sources on a single screen at the same time. For example, you can watch TV and video simultaneously.

Dolby Digital
This is the digital sound standard developed by the Dolby Laboratory. You can select your preferred digital surround mode after connecting external speakers.

Digital Broadcasting
Digital Broadcasting is a television broadcasting signal digitized and transmitted according to the United States' terrestrial digital broadcast standard, or ATSC.

Mono
A type of audio interface that transmits the audio signal through a single channel only.
Through a mono interface, it is hard to experience stereophonic sound and the sound is played using only one speaker.

Reception Sensitivity Amplification (LNA)
A signal amplification technique that amplifies a weak broadcasting signal by applying satellite technology to provide better visual quality even for users in regions where only a weak broadcasting signal is available. (LNA: Low Noise Amplifier)

Sub Woofer
A Sub Woofer is a speaker for ultra bass sound output only whose frequency is as low as 150Hz. There are two types: an active type which includes an amplifier, and a passive type, which requires an additional amplifier.

Stereo
A type of audio interface that transmits audio signal through 2 channels.
Stereo transmits audio signals for right and left sound so that you can experience stereophonic sound, and the sound is played through 2 speakers.

Partial Color Blind Person Mode
Using this function, a user can adjust the red, green or blue colors according to the preferences of the partially color-blind person so that he or she can view the clearest possible picture on the screen.

Analog Broadcasting
Analog Broadcasting is a television broadcasting signal transmitted according to the NTSC standard.

ANTENNA IN Port
The port connecting the TV aerial via a coaxial cable. It is generally used for watching public broadcast programs.

English Caption
A function that displays English captions or text information included in the broadcast signal or video tape. You can use this function for your English studies by watching AFKN or CC marked video tapes.

Video/Audio Ports
You may experience poor visual and audio quality when watching a video tape on channel 3 or 4 through the antenna cable. You can experience better visual and audio quality by connecting the TV and VCR through the Video/Audio ports. The video port is in yellow, and the audio ports are in white and red.

Wide Screen
Wide Screen refers to a screen that is horizontally longer than a conventional TV screen.
While the aspect ratio of a normal TV is 4 : 3, that of a wide screen is 16 : 9.

External Input
External Input is a connected video device such as a VCR, camcorder, DTV receiver, DVD, etc. as a video source.

Satellite Broadcasting
Satellite Broadcasting transmits programs via satellite so that a program can be viable in all areas at a high visual and sound quality. Approximately 100 channels including public broadcast channels are provided. To view a satellite broadcast, you have to install an additional receiver.

Wire Broadcasting
Wire Broadcasting refers to movie, entertainment and educational programs transmitted by a broadcasting station within a hotel or school.

Audio Multimix
Audio Multimix provides 2 audio languages when foreign movie, drama, news, etc. are broadcast. You can select and listen to one of the supported languages or you can select and listen to both languages simultaneously.

After-Image Protection
Using this function, a user can configure the options necessary for protecting the PDP TV screen.

Power Saving Mode
This function adjusts the screen brightness according to the ambient brightness so as to conserve power.

Component Port
The Component Port transmits a separate luminance signal as well as the green, blue, and red color signal and provides the best quality of all video connection types.

Cable Broadcasting
Cable Broadcasting transmits programs via cable instead of via the air. To view cable broadcasting, you have to subscribe to your local cable broadcast service provider and install an additional receiver.

Tuner
A device that enables the selecting of specific channel frequencies for TV or radio.

Panorama Screen
This refers to a screen that corrects the picture distortion due to a screen size mismatch on the TV.

Progressive Scan
Progressive scan displays the entire frame in a single sweep so as to provide clearer and sharper visual quality.

Anynet
Anynet is an AV network system that enables an easy-to-use AV interface for users by controlling all connected AV devices through the Anynet menu when the AV devices of Samsung Electronics are connected.

DVD (Digital Versatile Disc)
DVD is a large capacity storage media that can store multimedia content such as video, games, audio applications, etc. using MPEG-2 video compression technology on a CD sized disc

DRC
This is a sound quality enhancement function that automatically controls audio output so as to prevent sound quality distortion even at loud volumes and correct the sound to the speakers so that you can listen to the sound at the original sound quality.

DVI (Digital Visual Interface) Port
A DVI interface is a standard for high definition television connectivity. It provides a clear picture on the screen using TMDS which minimizes video signal loss.

DVI-D Cable
A type of DVI connector. Using this cable you can only transmit digital signals.

DVI-I Cable
A type of DVI connector. Using this cable you can transmit either digital or analog signals.

HDMI
HDMI (High-Definition Multimedia Interface) is the first industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any audio/video source, such as a set-top box, DVD player, and A/V receiver and an audio and/or video monitor, such as a digital television (DTV). HDMI supports standard, enhanced, or high-definition video, plus multi-channel digital audio on a single cable. It transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements.

PCM
PCM (Pulse Coded Modulation): This refers to an uncompressed digital signal. Use this for an AV amplifier that does not support 5.1 channels when connecting the audio output via optical or coaxial cable.

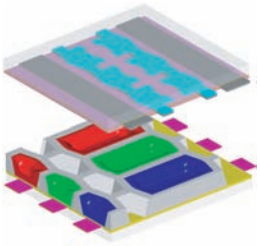
SRS TruSurround XT
This function provides 5.1 channel surround sound using 2 channel speakers when inputting a stereo audio signal.

VESA Plug & Play
This function enables the automatic recognition of devices when connecting the TV to the computer without additional settings.

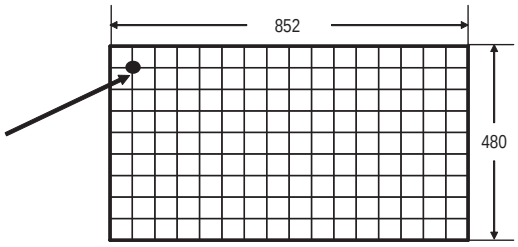
S-VIDEO IN Port
This is called super video. S-Video is a type of video signal which has the video luminance and the color signal separated in order to provide better visual quality.

VHF/UHF
VHF refers to TV channels 2 to 13, and UHF refers to TV channels 14 to 69.

Pixels, Resolution
The pixels are the number of small dots that make up the TV screen. The resolution represents the number of pixels on a screen. For example, if the resolution of a TV is 852x480, it means the width of the screen consists of 852 pixel columns and the height of the screen consists of 480 pixel rows. In this case, the total number of pixels on the screen is 408,960. The more pixels there are, the higher the visual quality that can be achieved because the picture on the screen is displayed with more pixels and therefore with more detail.

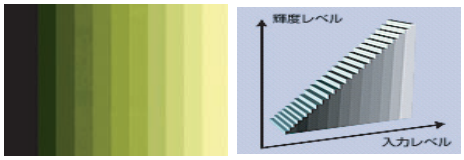


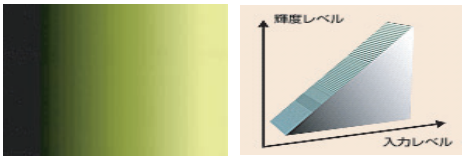
1 Pixel = 3 Sub Pixel(R+G+B)



42SD = 409K Pixels

Gradation, Color Depth
Gradation describes the number of gradual brightness levels. Since all information is represented by binary numbers in a digital system, the Gradation is determined by the number of bits used to represent the brightness levels of a pixel on the TV screen. For example, if a pixel is represented by 8 bits, the Gradation is 28 or 256. Since a TV uses the three primary colors of light, R, G and B, the number of possible colors for a pixel is 256 x 256 x 256, 16,777,216, or 16.7 million colors. If 12 bits are used for a pixel, the gradation is 212 or 4096 for a color. Since three colors R, G and B are used, 4096 x 4096 x 4096 or 68.7 billion colors are supported per pixel. Since 68.7 billion colors are far more than 16.7 million colors, the picture will be displayed by far more abundant and natural colors using a 12 bit pixel. That is, since Gradation means the number of brightness levels, color represented by 4096 levels appears more natural than color represented by 256 levels.



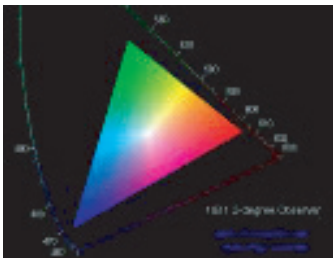


Contrast
The contrast is the ratio of brightness of the brightest color to the darkest color. The contrast is calculated by dividing the brightness of the brightest color by the brightness of the darkest color. For example, if the brightness of the darkest color is 1 and the brightness of the brightest color is 3000, then the Contrast is 3000/1 or 3000. A higher contrast means that a dark color is displayed darker and bright color is displayed brighter so that the screen contrast can be easily distinguished. The contrast differs from the Gradient which means the number of brightness levels.
Therefore, if someone says that a 5000:1 contrast displays a color by 5000 levels, he is confusing Contrast with Gradation.

Brightness
Brightness is the brightness per unit screen area, the unit for brightness is candela (cd). For example, 1000cd/m2 means the brightness that is measured when 1000 candles are lit within 1 square meters area.

Color Reproductivity

Each color displayed on the TV screen is implemented by a pixel on color coordinates which have an X and Y axis. For example, when a pixel on the X coordinate 0.65 and the Y coordinate 0.74 is displayed as a color and it becomes visible on the TV screen. While the possible color coordinate area is very wide, the color coordinate area of the signal broadcast from a broadcast station is smaller than that of possible color coordinates. Moreover, a TV provides a smaller color coordinate area than that of the signal from the broadcasting station even though the size of the color coordinate area varies depending on the TV model. In general, Color Reproductivity is used as follows:



The Color reproductivity of a TV is a certain % of NTSC. This means the TV displays that particular % of the color coordinate area of the NTSC signal broadcast by the broadcasting station. In general, a CRT TV provides the highest functional color reproductivity.